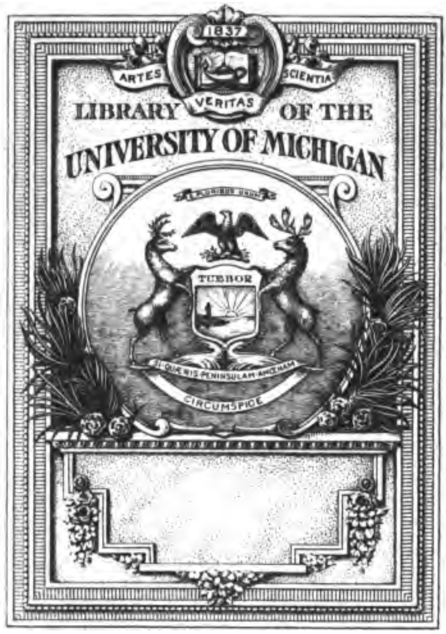
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THE JOURNAL OF

Balneology and Climatology

Being the Quarterly Journal of the British Balneological and Climatological Society

EDITED BY

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AND

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VOL. VII.—1903

London

JOHN BALE, SONS & DANIELSSON, LTD.

OXFORD HOUSE

83-89, GREAT TITCHFIELD STREET, OXFORD STREET, W.

Med. Nampton 3-31-26

THE JOURNAL OF

BALNEOLOGY AND CLIMATOLOGY.

JANUARY, 1903.

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VOL. VII. JANUARY, 1903. NO. I.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

Original Communications.

PRESIDENTIAL ADDRESS ON FAR-AWAY CLIMATES.

BY E. SYMES THOMPSON, M.D., F.R.C.P.

TO-DAY we inaugurate the Eighth Session of our Society. Each year has been marked by progress, and our Society has now attained a recognised position among the medical organisations of the country.

Hitherto the Chair has been occupied by representatives of the spas and health resorts. Now for the first time a metropolitan physician fills the Presidential Chair; indeed, without an alteration in the bye-laws I could not have held the office to which you have graciously appointed me, for although London is a marvellously healthy city, it can scarcely be classed among the "health resorts" of the British Isles.

Although not connected with any particular spa like my predecessors, I yield to none in devotion to the cause for which our Society exists.

Early association with baths—Buxton, Bath, Harrogate and Malvern—followed by visits to the German spas and Pyrennean springs, naturally led me to bestow much attention to the value of climatic and spa treatment.

Subsequent trips among the Alpine health resorts, Scandinavia, Austria, Italy and Spain, followed by tours to Greece, Palestine, Egypt, Algiers and South Africa, have tended always to impress upon me the belief that much of our future well-being depends upon the wise choice of climate.

Dr. Douglas Kerr, in his Presidential Address last year, gave us information regarding the birth of our Society; a few further particulars regarding its pre-natal conditions may not be without interest, and it may be well to record the circumstances under which the Scientific Committee on Balneology and Climatology was appointed.

Sir Edward Sieveking, in his address as President of the Royal Medical and Chirurgical Society in 1888-9, pointed to the need for full enquiry into our English and foreign health resorts; the medical profession, he said, should guide the public, showing them what they lose and what they gain by foreign travel. He averred that the library of the Royal Medical and Chirurgical Society was strangely deficient in reliable works on British Balneology and Climatology. He quoted with kind appreciation from my paper on "South Africa as a Health Resort," in which I stated that the public mind was slowly "awakening to the knowledge that the British Empire possesses climates adapted for every form of constitutional defect, and that spas in our Colonies are equal to any to be found on the continent of Europe."

Sir E. Sieveking proposed that a Scientific Committee should be appointed, and requested me to draw up a scheme for the use of the Council. I ventured to suggest that there was an urgent need for a systematic investigation of baths and climates, that the practice of balneo-therapeutics should be placed upon a scientific basis, and that a report on the waters and climates of the British Empire, prepared by representatives of our leading medical Society, would be greatly valued by the profession.

The suggestion was approved by the Council on May 14, 1889, and accepted by the Society, but with the limitation that it should at first be confined to the spas and climates of Great Britain, Scotland and Ireland.

In the first volume issued by the Committee in 1895, the

chief bathing places of England and the climates of the south of England were alone discussed. The second volume, issued in the present year, comprises reports on the rest of England, with Wales and Ireland.

Dr. Dickinson wrote the first paper, giving a delightful survey of the characteristics of the climate of Cornwall. The second and third papers on "Devonshire" and on "The Channel Islands" were contributed by myself, and subsequent papers became more and more elaborate as the work expanded.

After the issue of the second volume the work of the Scientific Committee ceased, and thus the urgent need for our Society becomes the more manifest, and it is for us to continue patiently to accumulate facts, to digest and assimilate them, and by means of our Transactions, to circulate throughout the profession the conclusions arrived at. Every number of our Transactions contains information about the spas and health resorts, which serve to keep the information contained in the volume issued by the Royal Medical and Chirurgical Society up to date.

We are, as Dr. Fortescue Fox has shown, laying the foundations of scientific balneology in this country. The time-honoured practice of treating disease by mineral waters and baths gains rather than loses support with the advance of knowledge, for balneo-therapeutics have now acquired a permanence and stability which empiricism failed to give.

In prophylaxis we are learning to use baths and climates with increasing discrimination. The recognition of forthcoming disease, tendencies, hereditary influences, acquired characteristics, environment, &c., enables us to use climates and spas with a preventive power which no drugs, rules of life, or other therapeutic influences can supply.

Whilst making full use of our own British baths and climates, which are varied and valuable, we must not neglect the continental mineral springs, and the various climates which the countries of Europe afford; and distant parts of the world, now brought near, must not be neglected.

The turbine for the ocean and the mono-rail on land are annihilating space; it does not seem impossible that ere long we shall travel by water at 40 miles an hour and by land at

200. To-day we can compass the earth in twenty-one times fewer days than the contemporaries of Magellan. Sir R. Bond has a scheme on foot for reaching America in 124 hours with only 75 hours at sea.

Again, the Russian Minister, Prince Kilkoff, estimates the rate of travel in the near future by the great Siberian Railway thus: Bremen to St. Petersburg, one and a half days; St. Petersburg to Vladisvostock, ten days; thence across the Pacific to San Francisco, ten days; overland to New York, four and a half days; New York to Bremen, seven days. Total round the world thirty-three days.

Thus "far-away climes" are being brought so near that we are bound to give them full consideration. Even the public is beginning to recognise that chronic disease needs for its cure: (1) months or years of wise treatment; (2) that a suitable climate is often essential for maintaining health or remedying disease; (3) that exceptional skill and wide experience are needed in the adjustment of climate to individual requirements; (4) that something more than diagnosis of disease is necessary before a climate can be adapted to an individual.

We must be students of character as well as doctors, for the character of a patient and his power of adaptation to new environments must be carefully considered, if we are to command success.

It is often desirable before sending our consumptive patients to a selected health resort to put them through a course of "open-air treatment." This may be done in or near London, or better on the south and east coasts, though some patients prosper inland. We are learning to put the "open-air treatment" in its proper place, not to regard it as a substitute for, but as an efficient handmaid to, climate treatment.

The public recognition of the value of "open-air treatment" and the undoubted success which has attended it, when carried out even in London, has for a time interfered with the prosperity of many health resorts both far and near.

It has been said that Madeira has especially suffered from the changed wave of opinion, whilst really the secret of the success of Madeira has been the open-air life that it promotes. It is doubtless true that during the last half century attention

has been drawn to the value of cold and bracing, rather than to humid and sheltered places, but for many patients an equable air, never too cold or too keen, is the real desideratum.

Madeira and the Canary Islands are now so easily reached in four or five days by beautifully appointed steam vessels that the evils of the voyage, and especially of sea-sickness, are greatly minimised. As a rule men stand sea-voyages better than women, and become generally adjusted to the movement in about twenty-four hours.

Sea-sickness, curiously enough, is a more important consideration in short voyages such as those to Algiers, Egypt, Madeira and Teneriffe, than in longer ones, *e.g.*, to South Africa, the West Indies, or Australia.

The Mediterranean is apt to be very unkind to travellers, especially in the winter, and the Red Sea route ought to be avoided in the hotter months. Although Algiers is reached from Marseilles in twenty-four hours the passage is often trying.

I say less about Algeria and Egypt than I should desire to do, having contributed last year a paper on the subject (see JOURNAL OF BALNEOLOGY AND CLIMATOLOGY, July, 1901).

Of the many routes to Egypt, that *viâ* Trieste is now the best. Seven years ago, after my first visit to Egypt,* I advised the long sea-voyage through the Bay, or the Marseilles route, as being preferable to that by Brindisi, Genoa or Constantinople.

These papers bring into prominence this fact among others, that where the nerve force is inadequate and the power of digestion, assimilation and nutrition at a low ebb, Algeria, Egypt, and the lower levels are to be commended, whilst the high altitudes favour peripheral circulation, relieve internal engorgement, and promote appetite and nutrition, beneficial to those the vitality of whose tissues is adequate to bear a greater strain.

Whether in Algiers or in Egypt the dry, equable air of the desert is the desideratum; *Biskra* is more accessible than *Helouan*, and very similar in its effects. *Assouan* is superior to

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* My paper on "Egypt as a Health Resort" appeared in the *Practitioner* in December, 1895.

either, but there is reason to fear that the social attractions of the new hotels will make Assouan resemble Cairo, and as the barrage comes into full operation the Great Lake, 150 miles in length below Philæ, will make the air more humid and lessen the value of Assouan as a health resort.

Camping out in the Libyan Desert south of Assouan is likely to prove of service in early cases of phthisis.

As we pass Khartoum and Fashoda and approach Uganda and the Great Lakes, there are, judging by the delightful book of Sir Harry Johnstone, high-lying districts of 5,000 feet elevation where Europeans flourish and where even English children may be reared. As regards Nyassa-land great improvements are being made.

The climate of British Central Africa is one in connection with which many widely differing views have been expressed. Nor need this be wondered at, for the term "British Central Africa" is a comprehensive one and embraces, from the point of view of healthiness, widely differing areas.

British Central Africa (as it now is) has to be approached through fever regions, the journey not infrequently in early days being made in open rowing boats under conditions of great discomfort. All this tended, no doubt, to raise the death-rate. Within recent years there has been a marked improvement, although it is doubtful whether the percentage of deaths has decreased, owing mainly to the too free use of stimulants.

The journey from the coast is made with a rapidity formerly unthought of and under fair conditions of comfort, and the traveller may arrive safely if he avoid stopping in the malarial districts and low-lying regions of the Zambesi *en route.*

Places like Blantyre, Zomba and Mlanje in the Shire Highlands, and certain parts of the Tanganyika Plateau, are in themselves wonderfully healthy. Were it not for malarial fever with its complications, and especially the hæmoglobinuric form, the country would be a very desirable one for the residence of Europeans. In most cases an ordinary bout of fever means little, but it is very different with blackwater fever which accounts for perhaps 25 to 30 per cent. of the deaths. Observations seem to point to the fact that this particular form of fever lays hold, not of the weaklings, but rather of men of robust

constitution who, just by reason of their strength, expose themselves more than is desirable in the tropics. There are those who have been in the country for many years, and who have never had an attack of "blackwater." Indeed this is, so far as concerns British Central Africa, of quite recent origin, although there may have been occasional cases in earlier days.

The wise selection of health stations in the tropics is a matter of pressing importance.

The Guild of St. Luke, of which I was long Provost, urged upon the Missionary Societies the need to provide medical missionaries trained in tropical hygiene and able to advise where the missionaries should spend the most dangerous part of the year.

Meteorological observations are now being taken, and no doubt a good deal of fairly reliable information has been gathered during the past few years.

We now possess a knowledge of the causes of malarial disease, and are armed with efficient preventive and remedial methods of treatment; places like Lagos and Sierra Leone, which have proved fatal to so many, are now robbed of their terrors.

The destruction of breeding-grounds of the mosquito has done much, improved sanitation and water supply have already secured a marked diminution in mortality, and the terrible death-rate has been strikingly reduced. In the Roman Campagna, in 1888, 21 per cent. of the population suffered from malaria; in 1897, 6·4 per cent., which has now been reduced to 3·7 per cent.

If the same precautions are taken in other tropical hot-beds of disease that have been so successful in Italy and in India there is reason to hope that many parts of the empire, that have been hitherto absolutely closed, will be rendered available even for delicate people.

Our Colonial Government—and for that we have to thank Mr. Chamberlain—is now alive to the need for action, and is doing much to further experiment in preventive measures.

Public enlightenment and the wide recognition of facts accumulated by Drs. Manson and Ross, will, we hope, soon bear fruit.

Colonisation in the past has failed from lack of knowledge, acclimatisation is merely a question of hygiene.

Crossing the Zambesi—indeed on either side of that river —we reach *Rhodesia*, a country of enormous extent, capable of receiving, and likely to receive in the near future a large number of settlers. It is for us to realise what sort of man and woman is fitted for this great portion of the Empire, which we owe to the far-sightedness and energy of Cecil Rhodes.

The malarial and other evils which at first hung about this region are already lessening, and it seems likely that the elevated portions of Rhodesia (above 4,000 feet) will prove havens of health and, let us hope also, of prosperity to many.

British Bechuanaland, the Transvaal and Orange Colonies, under the new conditions which Lord Milner is now formulating, afford extensive areas for future healthy development.

A hundred thousand suitable settlers should be absorbed in the newly acquired portions of our South African empire during the present decade. The medical profession can do much to aid in the selection.

Where irrigation can be adopted there agricultural prosperity will increase in the Karoo.

Since 1873, when my first paper was published in the *Transactions of the Royal Medical and Chirurgical Society*, on "The Elevated Health Resorts of the Southern Hemisphere," my thoughts have been so much directed to South Africa as a health resort that I must not allow myself *now* the opportunity, which may, perhaps, occur later, of dealing in detail with so extensive a subject, and one, too, of pressing importance and suited for discussion by our Society.

New information has been culled during the war, but as yet this is scarcely tabulated or adequately arranged. The coast climate of South Africa is not to be recommended for permanent sojourn, though the seaside resorts, *e.g.*, Kalk Bay, Muizenberg, Knysna, may be useful for short changes. Here March, April, May and June are pleasant, cold winds occur in July, and December, January and February are very hot.

The sub-tropical climates of the Natal coast, the malarial parts of the Transvaal and Rhodesia are not suited for invalids. The elevated inland climates, the Karoo, Natal Highlands,

Orange Colony, the central parts of the Transvaal and of Rhodesia afford what is needed for them. Here the air is dry in winter, with abundant sunshine in summer, but with cool nights. Rainfall is limited to summer thunderstorms, there is no standing water, the air is dry, bracing, sunny and rarefied.

Various elevations are available, open-air life is possible all the year round, and the expense of living, away from mining centres, will not be heavy when the country has got over the effects of the war.

Dust and wind are the great drawbacks, especially in and near the towns. The range of temperature is great. Hunting, farming, tutorising and store-keeping are the occupations available. The bustle of the mining centres is unsuited for invalids.

South Africa is at present unfit for poor invalids. Cases of advanced disease are not of course suitable, nor are refined, sensitive people with weak digestions. The accommodation up country, even in hotels, is primitive; a boarder in an English up-country farm, ready to enter into the home life of the farm, may do well.

Among the lower elevations Ceres, Caledon, Magersfontein may be mentioned; among those of medium elevation, Barkley West, Cradock, Graham's Town. Of the higher elevations (4,000 feet), Middlesburg, Aliwal North, Howick (Natal), Bloemfontein and district (O. Colony), Harrismith, Ladybrand, &c.

Medical counsel should be obtained on arrival at Cape Town as to the most suitable quarters.

The high plateaux of Natal differ markedly from the Karoo in the higher rainfall and consequent improved vegetation. In the western districts of Cape Colony the rainfall is but 3 to 4 inches, and often two or three years pass without rainfall; on the east coast of Natal, however, the rainfall is from 45 to 50 inches, Durban 39, and Maritzburg 38 inches.

The rain falls only in the summer months, the winter is brilliant and cloudless.

South-west Africa gets its sparse winter rains from the icy waters of the South Atlantic; south-east Africa its ample summer rains from the warm Mozambique current of the Indian Ocean.

Natal, the "Garden Colony," is park-like by nature, with millions of acacias. "If a perfected English climate is ever found anywhere it is surely in the mountains here."† The air is clear, fresh, "champagne-like" and highly aseptic.

Turning to *Australia*, we note that there is a strong likeness between the climates of the eastern provinces of *South Africa* and those of *New South Wales* and *Queensland* at corresponding latitudes.

The plateau character of S. Africa is more marked than that of Australia, though the Darling Downs reach to an elevation of 3,000 feet. In central tropical Africa the general level is about 5,000 feet, whereas the central parts of Australia are not elevated.

Freedom from fever may be counted upon until N. Queensland is reached, and, as in S. Africa, need not be feared so long as the coast lands, the river banks and the shores of the lakes are avoided, while on the open plateaux, even of equatorial regions, the danger of fever is but small.

In Australia, as in Africa, the mid-day sun is hot but the evenings are cool.

As population increases efforts to conserve the water and develop irrigation will be made, and will enormously extend agriculture. The magic touch of the engineer will convert half-formed natural reservoirs into fully formed irrigation systems and waste lands into valuable farm lands.

Artesian wells are proving of great value in extensive tracts of country where the porous soil allows the rain to pass directly into the earth.

The mean rainfall of Australia is 21 inches, that of the whole of Europe 15.

Australia is colder than corresponding European latitudes, and the snow limit is 1,000 feet lower. On comparing the Australian and European cities we find that Algiers, although 3° nearer the Pole, is as hot as Perth (W. Australia). Barcelona, 6½° nearer the Pole, has much the same shade temperature as Adelaide. Melbourne is the same as Madrid, which is 2½° nearer the Pole. Sydney has a mean shade temperature of

† "New South Africa," by Mr. Lincoln Tangye.

62·5° the same as Toulon, 9½° nearer the Pole, and Brisbane is like Alexandria, 4½° nearer the Pole.

According to latitude Australia would extend from Abyssinia to the south of France, according to temperature it would cover Europe to the latitude of Edinburgh.

Much of Victoria is analogous to the south of England. The sea-coast towns are humid, but within easy reach are cooler and drier mountain resorts, suited for invalids; for instance, at Toowomba in Queensland the mean temperature is 62·4°, its elevation being 1,960 feet.

The summer months in Australia are December, January and February. During these months at least it is oppressively hot in nearly all parts, except perhaps on the few hills or mountain resorts, such as the Blue Mountains near Sydney and the Darling Downs in Queensland.

The coolest and pleasantest months in Victoria and New South Wales are from about April to November, when the climate in most parts may be considered good and healthy.

There is a continuous range of mountains running north and south, almost parallel with the east coast of Australia, called "the Darling Downs," "the Blue Mountains," "the Australian Alps," &c. This range has a considerable influence on the climate, which at either side of it differs considerably at the same time of year. The climate on the coast side, during the hot months, is very hot, humid and changeable. Sydney at this time is a most enervating city to live in. It has a moist hot-house kind of atmosphere, keeping up a perpetual state of perspiration, fatal to one's linen, even when the thermometer is comparatively low. Sydney people go to the Blue Mountains in summer, two hours' railway journey inland; the highest part is about 3,000 feet above sea level. They form a plateau intersected by deep wooded gorges. The climate is good on these mountains in summer, but changeable. The days are hot, the nights cool and refreshing; in winter they are foggy and cold. Melbourne is not so oppressive as Sydney, but is very hot in summer. For weeks in summer the thermometer by day often does not fall below 90°, being as high as 102° in shade. In the sun it rises now and then as high as 156°. All along the coast side of, and on the mountains, the climate is very

changeable. The hot north-west wind, which comes from the interior over miles of arid plains, will suddenly veer round to S.E., which comes from the sea (and is known as a "southerly buster"), and the temperature will drop as much as 40 to 50° in an hour or two. Needless to say this is trying to invalids who happen to be caught when clad only for tropical heat. Melbourne is more subject to this sudden change than Sydney, and it often occurs in the Blue Mountains.

During the hot weather in the interior the heat is very great, but it is a dry heat, and not like that of the coast. It is, however, more than ordinary beings care to put up with at this time, and most of the squatters prefer the coast in spite of its drawbacks. There is generally no rain, and all signs of grass and vegetation disappear. There is little shade, as the foliage of the trees on the plains is very sparse, and most of them are "ringed," which is done to kill them preparatory to clearing. Altogether life has not many attractions, especially when, as is frequently the case, there is a drought and the sheep die by hundreds, fouling the little air there is. At Broken Hill the heat is as much as 120° in the shade. Nearly all the land west of the mountains is a vast plain, often quite treeless. The rainfall which is heavy on the coast gets less and less as one goes inland, and in the far interior I believe the average is only two inches, where even the few rivers soon run dry.

During the winter and cool months the climate is pleasant enough in most parts of Australia, and particularly in the interior when no drought exists. The nights are cool and refreshing—in some parts there is often slight frost—and the days are bright and pleasantly hot and the air exhilarating. The rains come at this time (if at all), and it is wonderful how quickly the grass grows. It appears like magic in places that were bare as the desert. The grasses of Australia are natural grasses and not English sown, as is the case in New Zealand. The soil is very fertile, and where irrigation can be used wonderful crops are raised. In the spring, too, the "bush" looks its best, and then life on a sheep station can be made most delightful. Some of the rich squatters have beautiful places with every luxury. The district called the Riverina (in N.S.W.) is particularly well favoured, and some of the largest sheep-breeders have stations in this part.

A very healthy and pleasant district is that known as the Darling Downs, in the southern part of Queensland. As this is high ground, the climate is good even in hot weather.

The best way to enjoy and benefit by the country or "bush" life is to stay on a station. The squatters are hospitality personified, but an introduction is necessary and it is not always easy for a stranger to arrange this. Life is spent on horseback or driving all day, and there is much to interest on the station and in the Bush; also good shooting in most places and kangaroo hunting for a change.

It is seldom wise for health's sake to stay in Sydney or Melbourne. Of course many who must earn their living have no alternative. Such would be better at home. The proportion of the population of Victoria and New South Wales in the cities of Melbourne and Sydney is very high—more than one-third—the country districts being very sparsely populated. The chief industry is wool growing, and the sheep stations are large and employ comparatively few men. Twenty or thirty men are enough to run (except during shearing) a property of 200,000 acres carrying 200,000 sheep. One sheep to an acre means good land. This will give some idea how few openings exist for those going out for health in the country districts unless they have capital or are of the labouring or artisan class. Many young fellows take the position of "book-keeper" on a station. The position is not much better than that of an ordinary hand and the pay the same—about £1 a week and food—but the work is not so trying, and it gives a man the chance of recovering strength and health, but there is of course no future prospect in such a life.

The climate of Melbourne is treacherous, with sudden changes, hot and cold winds, and great extremes, and for this reason is not generally regarded as favourable for persons suffering from pulmonary complaints, though suitable inland localities may be found under the advice of the doctors in Melbourne. Ballarat is better, but colder and more bracing. Victoria has inland climates which are perfect almost for dry air and settled weather. New South Wales has a double climate; Sydney is hotter than Melbourne but has the great advantage of cool nights in the summer. South Australia has

all sorts of climates, and Adelaide has a decided summer and winter, and the spells of heat are of long duration and therefore more easily borne than the sudden three days' hot winds of Melbourne. Tasmania has a delightful climate, equable, but colder.

South Africa has equal, and in some respects superior merits, but life in Australia is healthier and there is greater social freedom. The excitement and rush are now over in Australia, but are just beginning in South Africa.

North Queensland is destined one day to become popular. Townsville, its natural capital (in the same latitude as Mauritius, Mid-Madagascar, Beira, Fiji, Chili, Bolivia) may be proud of its climate. The air is light and refreshing, hence sunstroke is rare, Englishmen can work without deterioration, and the more active the women the less they suffer from heat. The coast lands are relaxing, and white women cannot bring up a family without injury to health, but many owe their recovery from chest disease to the dry air of the inland Downs. We may anticipate that in a climate so different from our own a somewhat different race will grow up, of slight build and wiry nature. In the United States of America individualism has had full play and self-reliance is developed to the highest pitch, but in the Australian Colonies the laws are opposed to the accumulation of capital in the hands of a few, and the Government is looked to for support in every department of activity. Peaceful development has been the characteristic, whereas in many of the American States every man was prepared to fight for his own, and the revolver and bowie knife were essential parts of every man's outfit.

The population of Australia is but half that of greater London, though the area is as large as Europe, and curiously enough the legislation of the Commonwealth is not directed to induce people to go out, but to shut the door against them.

The death-rate of Queensland is low; Brisbane 10·90 to 14·99 per 1,000—for the whole Colony 11·72 per 1,000.

The best months to go by the Suez Canal are the winter months, as the heat of the Red Sea from May till September is trying.

Steamers go to Australia now by the Cape of Good Hope,

and the weather conditions are generally regarded as good for invalids, although sometimes heavy weather is encountered in the run far south between the Cape and Australia. An alternative route can be taken *viâ* San Francisco and the Pacific.

New Zealand is a windy land, and Wellington is its most windy city. The boisterous gales last as a rule for three whole days without abatement, and are trying to people with irritable nerves. A day or two of comparatively calm weather intervenes between the bouts of wind, and for a few weeks in autumn stillness prevails.

The snow line in New Zealand is 2,000 feet lower than in corresponding latitudes in Europe.

Dunedin is like Scotland, Christchurch more like England, very cold in winter and subject to heavy white mists.

At Auckland the climate is said to be delightful; though too hot in summer it is wet and cold in winter. Yet camelias, roses and arums flourish throughout the year.

Nelson on the north of the South Island is sheltered and "sleepy."

Speaking generally the climate of New Zealand is, as might be expected in the open ocean, windy and moist. It is healthy, briskly cheerful, its prevailing characteristic being light.

Though many days of summer are hot they are seldom sultry. Sharp as are the night frosts of winter in the South Island, the days are radiant, with seven or eight hours of clear sunshine.

The rains are heavy but not prolonged, fogs and mists are rare, not brown or yellow, but more the colour of a clean fleece of wool.

"High lying and ocean girt the islands are lands of sunshine and sea."

So far from being the antipodes of Britain, the long, narrow mountainous islands lie, on an average, 12° nearer the equator (Liverpool is on the fifty-third parallel of N. latitude, whereas the central city of New Zealand, Wellington, is on the forty-first S. latitude). New Zealand has no warm Gulf Stream, nor has she east winds coming over a chilled continent. One thousand two hundred miles of deep and stormy ocean separate it from the flat, rounded, massive continent of Australia, which except on its E. and S.E. coasts is as hot and dry as South Africa.

The west coast of New Zealand is one of the rainiest parts of the world, and even the drier east coast rarely suffers from drought.

New Zealand is a land of cliffs, peaks and volcanic cones, and is ridged with Alpine ranges comparable with the Pyrenees. The Australian woods are park-like, eucalyptus prevailing.

The New Zealand forests are cool, noiseless forests, deep gorges, giant thickets, tropic labyrinths of tangled interlacing creepers. The forest trees are evergreens, fresh-looking even in mid-winter.

The climate of the north differs from that of the south, but the contrast is more marked between east and west. The matted jungles of the western side of the central watershed contrast with the bleak and bare-ribbed, unclothed mountain-sides of the east.

The sulphurous waters, like those of Algeria, pour forth volumes of steam and are excessively hot (nearly 200°).

The geysers are like those of Iceland or Hamann Meskotine, bursting forth in numerous cones and overflowing so as to form white and coloured terraces.

The forests rise to the snow line and the glaciers come down to within 700 feet of the coast.

In the extreme north the climate is semi-tropical. In the more southern parts the climate is very good and much more equable than in Australia. Napier, Nelson, Christchurch, Dunedin are all good centres, and almost all conditions of temperature can be found.

To a man of moderate desires and means New Zealand offers many more facilities than Australia. Life is more homely there, and living better and cheaper—it is in fact more like England. Butter, cheese, meat, fish, and all the necessaries of life are far superior to those of Australia—no doubt owing to the climate, which is free from droughts and other extremes.

The Government is most progressive, and many advanced political and economic doctrines are in actual practice, not omitting universal suffrage.

The scenery of New Zealand is very varied, and offers more attractions than Australia.

Thirty years ago it was my privilege to draw the attention

of the Royal Medical and Chirurgical Society to the Hill stations of India and Ceylon. Of these I have no personal knowledge, but Sir Joseph Fayrer (than whom no more competent authority can be found) gave to our Society in 1900 an invaluable digest of the subject, which occupies 18 pages of our Journal (July, 1900). He dealt with Indian climates not merely in reference to the treatment of disease and convalescence, but as resorts in which Europeans may preserve health, and avoid that physical deterioration which inevitably results from protracted residence in the plains.

Sir J. Fayrer gives us a physiographical survey with the consequent climatic attributes of the varied parts of India, and describes the Hill stations which have already proved, or are likely to prove, of value, expressing a hope, which we all share, that our Society may be the means of drawing further attention to the Hill stations of India, which certainly are calculated to prove of ever increasing value to our race.

It has been my aim not so much to give an exhaustive description as to give examples of a sufficient number of "far-away climates" to show how much there is to be learned about them.

The prevailing character of Australia, New Zealand, South Africa and Canada is spaciousness, largeness, freedom, not only in the bush, the veldt and the prairie but in the great towns; Melbourne, Sydney, Adelaide, Auckland, Wellington, Durban, Cape Town, Montreal or Vancouver, each city spreads itself over an enormous acreage with broad roads and extensive parks, each house having its own gardens, the towns spread into the surrounding country, the cable-electric cars and telephonic system bringing every place near. The populations even of the towns live largely in the open air, physical strength and vigour are promoted, and mental activity increased.

The comparative sparseness of the population naturally brings about conditions which promote self-reliance and self-confidence, and enable the inhabitants of these Colonies to act for themselves with a vigour and independence rare in our crowded cities.

More settlers are everywhere wanted for the ranching farms and for land where millions of untilled acres await the advent of a British population. In the North West territory of Canada,

where there are 300,000 square miles (192,000,000 acres) of land of unsurpassed fertility, every settler gets 160 acres of land free and becomes a landowner himself. But the emigrant must be fit, constitutionally and morally, for his new life.

Florida again has been resorted to, often with success, by young Englishmen seeking to escape from winter. and to occupy themselves in growing oranges and lemons.

Nassau, in the Island of New Providence, is the centre of the Bahama Islands.

The Bahamas form an English colony, the most northern of the group of West Indian Islands. Nassau is becoming well-known now, especially in America, as a health resort during the months of January to April. Frost is unknown in the Colony, whereas in Florida there are occasional frosts which completely destroy the orange crop.

There are two ways of approaching Nassau, either by a direct route from New York by sea, a journey of 900 miles south from New York, or from New York to Florida by rail, two days' journey, then steamer across to Nassau (seventeen hours).

There are hotels capable of containing a large number of guests. A doctor is always to be found in the hotel. Nassau is much recommended for those unable to stand the rigours of a northern winter, on account of lung troubles. There is a wonderful clearness in the atmosphere, and a singular charm in the beauty of the sea and the little town.

Fogs are unknown. The average temperature during the winter months is about 70°, sometimes even before the middle of April it is as high as 86°. A cold N.W. wind will reduce the temperature to 56° and occasionally a little lower.

The change from a New York winter to summer immediately on entering the Gulf Stream (two days from New York) is most striking.

Few things are more refreshing for a man who is run down, but not actually incapacitated, or more delightful, than the voyage to the West Indies. The entire change to a warm climate after four days at sea, the interest of the tropics, the beauty of the West Indies themselves, make up a delightful whole. The best time for such a voyage is between the end of October and the beginning of April. The climate is then

delightful, and the heat is modified by a breeze on or off the shore. The ideal thing is to stay from October to April. From December 15 to February the voyage is apt to be rough.

From Jamaica or from Barbadoes one can set out for the other islands; the best tours are (1) from Barbadoes northwards, touching at many islands, to St. Kitts and St. Thomas, and (2) from Barbadoes southwards to Trinidad; the former is cooler and drier.

Jamaica is the most interesting island, then come some of the smaller islands, especially Dominica, which is very lovely, but the hotels and boarding-houses are not so good. For health, nothing could surpass the east coast of Barbadoes, where the Atlantic thunders in upon reefs and delightful beaches of coral sand. It is less interesting, less distinctively tropical, but ideal for a jaded man who is fit for nothing but to keep still and get rested.

The importance of the West Indies, climatically and politically, is not sufficiently recognised. When the Trans-Isthmian Canal is made their strategic value will be great, and the loss of them would be a national calamity. We are not only climatological physicians but also citizens of the Empire, and must do our best to promote its development.

We doctors have a part to play in building up our national strength by encouraging emigration.

Jamaica, a perfect natural Paradise, has during the last two years emerged from its poverty-stricken condition into prosperity, it is becoming a favourite resort of British tourists and American visitors. Its fruit trade is growing by leaps and bounds and the sugar cultivation is reviving. Already it has a fortnightly, shortly to become weekly, service of fast and well-appointed steamships. Good hotels are springing up. The development of bananas, oranges and other fruits seems limitless, and this wonderful island is becoming year by year of ever increasing importance to the health seeker.

A traveller writes: "The thermometer marks 84° in my room, but a delicious cool breeze blows in from the mountain, and even when the mercury ran to 88° there was no humidity or oppressiveness in the air. And to think that it is mid-March, and that this is no treacherous time for us to abandon winter

wraps only to be caught in a blizzard to-morrow, but a steady, all-the-year climate, for there is scarcely a variation of 10° in twelve months. There are no reptiles, and there is fruit and there are vegetables enough to keep one well and hearty at small cost and with small labour, and all this in four days and a half from New York, and on comfortable and clean ships—the United Fruit Company Line."

I hope in the coming Session to secure a paper on the West Indies, especially on Jamaica, from one conversant with the islands and able to speak with the authority of an expert.

The most suitable time for a visit to the West Indies is in December, January, February, March, returning before rains begin in April.

The rainy season is October and November, and a visit must be timed between then and April, which is generally a wet month. In January and February it is dry, bracing in the hills, the thermometer rarely exceeding 86°, with very cool nights.

In the plains and by the sea it is more equable, but there is always a fresh sea breeze during the day and a pleasant land breeze at night. Care should be taken in the evening to avoid chills taken after sunset. (These remarks have special reference to Jamaica, but the same applies to all the other islands.)

The voyage to *Brazil* made between May and September, by the Pacific Steam Navigation Company, is agreeable and inexpensive.

The rainy season in the interior of Brazil lasts from September to March. Yellow fever need not be feared after April.

The main valley of the River Amazon is healthy, being perennially swept by the trade winds; the tributaries, often many miles wide, are unhealthy, their course being at obtuse or acute angles to the direction of the trade winds, and their shores shrouded with impenetrable primeval forest where malarial influences rest undisturbed.

Before the relation of mosquitoes to malaria had been discovered, the fact that mosquitoes flourished in millions in the lagoon-like expansions of the great Brazilian rivers, when in the main current of the stream both mosquitoes and malaria were absent, was a great puzzle to travellers.

Among the Brazilian health resorts suitable for chest cases the Auraucaria Pine Forest regions of the Parana may be specially commended.

The Campos de Tordas is near Rio de Janeiro, though difficult of access, and Theresopolis, four hours from Rio, has good hotels and magnificent scenery. Parana is accessible by steamer from Rio de Janeiro. The hotels are plain, but the climate is genial and delightful.

A few details may be of service regarding the time of year during which the more distant places may be advantageously visited.

Some of the tropical resorts are healthy for a few months only in the year, whilst others, healthy at all times, are most attractive during the months named in the following list. These are arranged under the heads of "winter" and "summer" resorts, *i.e.*, places available for English people during those seasons in England.

The West Indies and Nassau, November to March; Brazil, September to March; West Cape Colony, November to March; New Zealand (South Island), October to March; Shanghai, October to February; Tasmania, October to May; Calcutta, December to February.

The above may be classed as winter havens.

Autumn:—Japan, September to November (also New York and the neighbouring States of America).

Whilst for our English *summer:*—The Eastern Provinces of Cape Colony and Natal, April to August; Canada, May to October; Tasmania, at any time, best June to October; Sydney, June to August; New Zealand (with islands and Western Australia), July to October; are available.*

When we cross the Atlantic we find on its eastern seaboard a race of men, of British origin, who under the stimulating influence of their climate have become keen, alert, unresting.

The man of the New World, freed from the conventionalism and conservatism of the Old, has developed a power of rapid, incisive action, enabling him to see what to do, and

* Dr. Lunn in "Travel" publishes each month a useful list of places, then available for tourists and health seekers.

to do it with a rapidity unknown before. In the medical and surgical spheres the doctors of the United States are taking a leading place, and in the financial world it has been truly said that New York, not London, is *now* the "hub of the Universe."

What, it may be asked, has this to do with climatology. My answer is—climate is *a* main, if not *the* main, factor. So exhilarating is the climate of the United States, especially of the Atlantic seaboard, that it develops an intense readiness for everything, a desire and a determination to succeed. American schoolboys are keen in work and in play, at College they strive to do better than the best, and at the age of twenty are ready and anxious to supersede and take the place of their elders.

Whilst in England directors of great companies are men past middle life, in America they are in the thirties and forties, rather than the sixties and seventies.

So racehorse-like are the typical Americans that in three generations, if unaided by new blood, they cease to be prolific, like the highly specialised winners of the Derby and the Oaks.

England must emulate the strenuousness of the American and the thorough business methods of the German if she is to maintain her position among the nations. If we are not too late in awaking to the facts of the opening century we may yet hope to hold our own.

When men come to England from "the States" they complain that England makes them "slack" and takes away their surplus energy, just as we Englishmen find is the case if we go to Algiers, to Egypt, or to Cape Town.

What then is the practical lesson to be drawn? It is this. If men and women are already too keen, if they are sleepless, excitable and neurotic, do not send them to live in the United States. If, on the other hand, they are torpid, lymphatic, and lacking in energy or in "go," encourage them to seek a home in climes where those qualities are more fully developed.

As we travel westward through the States we meet with varying types of climate and of character. In Colorado the great elevation above sea level has an influence on health and life to which the attention of medical men in England has been frequently drawn, and in Denver and its neighbourhood there are many prosperous men who, had they remained in

Europe, would have died of lung disease, or remained as "poitrinaires," having gained perhaps a *modus vivendi* by escaping every winter to the sunny south.

When we reach the Pacific seaboard and the delicious climate of South California we meet with a condition more allied to that of Southern Europe.

Our own Dominion of Canada has no elevated resorts comparable to Denver or Colorado Springs, but it has a beautiful summer climate, and the long, unbroken frosts of winter have brought health and vigour to many. Of the attractions of Colorado and California much needs to be said. Let us hope that in this or in coming sessions of our Society fuller information may be laid before the profession in England than we at present possess.

National Character and Climate.

The British Empire, now loosely compacted, is tending to form a great organism, united by nerves of sympathy and cords of love, but if we neglect to do our part in promoting this consolidation, we may see another disruption like that which separated us from the United States.

In considering the suitability of a climate for application to an individual case, the characteristics of the individual must be considered as much from a moral as from a physical standpoint.

When the question is the choice of climate as a remedy for disease we can see our way fairly, and experience is not lacking, but when the selection has to be made with regard to moral idiosyncracy, the difficulties are considerable. Much light may, however, be thrown on this matter by the consideration of the many interesting questions regarding the influence of climate, diet, &c., on national character.

We all know, so far as the British Isles are concerned, that if we seek hard-headed, persistent industry, and capacity to overcome difficulties, which are characteristic of the Scotchman and Yorkshireman, we look to the north, especially to the inhospitable east coast; whereas from the west of Ireland and the south-west of England we expect to find a lack of this capacity to overcome obstacles.

These things we notice among nations, if we compare the

Norseman and the hardy German with the Italian, the Spaniard, or the Frenchman. We speak of the "Slavonic" and the "Celtic" types, and recognise how much these types are dependent on climatic influences extending over long periods of time.

A large view of national character brings forcibly before us that climate is a main source of race characteristics.

In our own Empire it is not merely the occupation that has made our Canadian and Australian and New Zealand brothers so efficient in the South African war.

The closer fusion of the Empire, the drawing together of brethren from each Colony or Dominion will serve to fortify the Anglo-Saxon stock, which already owes its greatness and stability to its mixed Teutonic, Celtic, and Norse origin.

The twentieth century marks a new stage in the evolution of the British Empire, in which each component part contributes to the organic unity of the whole. The organs and their functions may be diverse, but all are bound together.

Our Society has already done much in drawing attention to English health resorts. It has also tended to bring together the medical men practising in those resorts. Our meetings, and the opportunity of dining together before the meeting, have served to cement friendships, and the association with metropolitan doctors has been, I believe, helpful.

Sir Hermann Weber has well shown that the highest success can only be attained by the loyal co-operation of the spa doctor and the physician who commends his patient to the spa. Such co-operation can be best attained when a personal knowledge exists, and our Society is to this end of special value.

If England is to maintain her position as the greatest Empire in the world's history it must be done by the adjustment of her sons to the conditions of life which the Empire demands.

But if we are to adapt ourselves to the vicissitudes of climate in our dependencies, we must learn how to meet and overcome malaria in its deadly haunts. By improved sanitation and housing we must lessen the vulnerability of our people; by wisdom in eating and drinking, clothing, exercise, &c., we learn that reputedly deadly climates can be borne with impunity, and we teach our sons to adjust themselves to the life of

Sierra Leone or the Gold Coast, as well as to the swamps of Borneo and the Arctic chills of Newfoundland.

A self-sacrificing regard for our people, whether the native races of India, Australia, or New Zealand, will keep them as our friends and consolidate our Empire, perhaps for all time.

Men like Lord Roberts or Lord Milner supply a key to the position, and enable us to enter upon the new century with hope and confidence.

The Empire is one and its population should be distributed in accordance with the laws of health. Whilst the Mother country is overcrowded the Colonies are sparsely occupied. The population of Australia now averages 1·5, and that of Canada only 1·4 to the square mile, whilst that of Europe is 100, and that of the United Kingdom 332 to the square mile.

Canada is thirty times and Australia twenty-six times the size of the United Kingdom, and vast areas well fitted for settlement await the advent of suitable settlers. Surely we can do something to move our redundant population to the redundant acres craving to be occupied.

Great Empires have hitherto been destroyed by selfishness. The possession of Empire carries with it duties and obligations. The stability of the British Empire is due to the fact that we have realised the rights of our fellow-men, and that it is our duty to give the blessings of freedom and prosperity to all under our sway.

If this principle prevails among the nations, the tendency to decay which grows out of a corrupt and tyrannical government will be banished. If we really recognise the rights of others we shall thereby establish our own.

We are beginning to realise the high privileges and responsibilities attached to Anglo-Saxon citizenship, and that the English-speaking race is a divine instrument for applying the principles of a higher—a Christian—civilisation to the government of the world.

As the first President of the Society drawn from the ranks of metropolitan physicians, I may perhaps be allowed to express an earnest hope that our Society may more and more become a means of promoting amity and goodwill throughout the country. It is a worthy ambition that such a result should be

secured, and we may rest assured that the Secretaries, the Council, and all the office bearers will, so far as in them lies, do their utmost to attain this end.

The Anglo-American Continental Medical Society, which serves as a bond of union between the British and American practitioners established on the Continent of Europe and Northern Africa, holds its meetings in Paris. I was invited to take the chair at their annual banquet on October 14, and ventured to suggest to the members of that Society that by joining ours and contributing papers and reports on their special health resorts, both Societies would be advanced and the whole profession benefited. The suggestion was well received, and will, I believe, bear fruit.

To draw together the medical men in our Colonies, in India, in Canada and throughout the world is a worthy ambition, and our Society is likely to prove instrumental in this respect also. If my year of office should do anything in this direction I should rejoice.

Reciprocity and federation are "in the air," we must be ready to read "the signs of the times" and move with the "spirit of the age."

Ours is a scientific Society in which the welfare of all is the aim of each. Whilst we desire, in the first place, to bring into prominence the attractions of our own spa, of our own country, we do not limit our view to the Continent of Europe or to our own hemisphere. We seek to ascertain and to distribute the knowledge we acquire of far distant havens, and to establish as it were a bureau in which information coming from the uttermost parts of the earth is received, tabulated, and made available for our loved profession.

When the Royal Medical and Chirurgical Society formed its Scientific Committee on Climatology, it was with the hope that such a Committee might be re-elected from time to time and keep up an intercourse with its representatives far and wide. Our Society, which has been shown to be the child of that Committee, is specially calculated to carry on this branch of its allotted work, and I would fain hope that in the time to come its papers, meetings and transactions may prove the means of spreading far and wide a knowledge of the ever-growing climatological capacities of the British Empire.

We have 400 millions of people in the Empire, but only 50 millions (one-eighth) of British stock, bound together by ties of kindred, race and blood.

Let us see to it that so far as our influence extends it shall be used in the ways that make for righteousness, and let us strive to maintain a high level of scientific accuracy, to advance the knowledge of balneology and climatology, and be the first to employ the newest and most approved methods for the discovery and elucidation of Truth.

NOTE ON ALGECIRAS (GIBRALTAR) AND ITS CLIMATOLOGY.

BY WILLIAM TURNER, M.A., M.D. (GIBRALTAR).

THE following remarks and meteorological statistics were originally intended as a reply to frequent inquiries regarding the climate and resources of the district of which Gibraltar may be looked upon as the centre. They may, however, also serve as a means of directing attention to a new and comparatively little known Mediterranean winter resort which has grown up in the immediate neighbourhood of Gibraltar, and owes its existence, as such, mainly to British enterprise.

In the province of Cadiz, and on the western shore of the Bay of Gibraltar, within a distance of five miles from the Rock, is situated the historic little Spanish town of Algeciras. It has a population of 15,000, and may be regarded as the market town for the southern portion of the province. It is to a small extent also a seaport, but its trade, such as it is, is conducted in an open roadstead, there being no enclosed harbour, and no proper wharves intended for the reception or shipment of heavy merchandise. Its shore is therefore entirely open to the wash of the tides, and being of a sandy and pebbly nature, it is well adapted for bathing and other seaside recreations.

Until quite recently the land communication between Algeciras and the interior was very bad indeed; only the most daring would have chosen this route by which to explore the picturesque scenery of Andalusia, and few travellers would have cared to break their journey here, to make even a short stay in the primitive hostelries which the town formely could boast.

For some years past, however, British capital has been doing much to bring this ancient town and its neighbourhood into prominence as a winter health resort. Algeciras is now the terminus of a line of English railway (the Ferrocarril Algeciras-Bobadilla) which pierces the mountain chain of the Sierra de Ronda (an off-shoot or prolongation of the Sierra Nevada), traverses some of the wildest and most romantic scenery of

the Peninsula, and connects with the main trunk of the Andaluces line running northward from Malaga to Granada, Seville, Cordova, Madrid, &c. It is to an English Company also that Algeciras owes its new Hotel Reina Cristina, a large establishment of the very highest order, which has recently been built a short distance to the south of the town, and is now, after a season's trial, undergoing extensive additions to meet the demands of winter visitors.

So far as I can ascertain, no reliable meteorological observations have ever been made at Algeciras. I take it that its climatic conditions are practically identical with those of Gibraltar, and the following statistics drawn from the Army Medical Reports of that station, may, I think, be accepted as applicable to Algeciras.

Situated in north latitude 36° 6′ 20″, and in west longitude 5° 20′ 53″, Algeciras lies nearly in line of latitude with Algiers and Malta, and is about 4° north of Madeira, 7° south of the Riviera, and 15° south of the Isle of Wight. Placed as it is near the junction of the Mediterranean with the Atlantic Ocean, and at a point where two great continents nearly meet, it follows that its climate will be influenced to some extent by each of these elements.

The following observations were taken at an altitude of 52 feet above sea-level. The average of five years' statistics is given:—

Mean annual barometric pressure... ...	29·987.
Mean pressure for the six winter months (October to April)	29·99.
Mean annual temperature in the shade ...	64° F.
Mean shade temperature for the six winter months	59·1° F.
Absolute minimum temperature	36·8° F.
Mean annual daily range of temperature ...	12·8° F.
Mean relative humidity of the air	70 per cent.
Mean amount of cloudiness (1-10)... ...	4·2.
Average annual rainfall	32·22 inches.
Average number of days when rain falls ...	74.
Average number of days when fogs exist ...	1.
Average number of days of clear sky ...	123.
Average number of days when sky is overcast	65.

Snow never falls and hail is rarely seen at Algeciras. The prevailing winds are east and west, and variations of these.

It seldom blows either from due north or due south. For about 50 per cent. (*i.e.*, half) of the year the wind is from W., S.W., or N.W. For 45 per cent. of the year it is E., N.E., or S.E. The east wind prevails more in summer, the west wind in winter. On an average the wind reaches the force of a gale on thirteen days annually. For the rest the winds are light.

With respect to rainfall, a table is appended (Table I.) showing the amount registered for each month during the past five years. It will be seen that June, July, and August are almost rainless, and that the rainfall is pretty equally distributed over the six winter months, with the exception that December is generally dry. It has not been found possible to draw up a comparison between the day and night rainfall, but the fact is beyond doubt that by far the greater portion of the rain falls during the night, so that the day rainfall is but a small fraction of the total amount registered. It is a matter of very frequent observation that a rainy night is changed into a bright and cloudless day, as if by sheer force of the sun's rays. Hence it follows that the number of rainy days requiring invalids to remain indoors during the whole day is very small indeed.

TABLE I.—RAINFALL.

Month	1897	1898	1899	1900	1901
January ...	6	4·6	6	3·0	6·20
February ...	·20	1·5	6·50	6·0	8·0
March ...	·20	6·0	3·0	9·0	10·0
April	1·8	2	·20	0·50	3·70
May	1·8	4	2·10	4·40	0·80
June	0	0·08	4·0	0·05	0·30
July	0	0	·10	0	0
August ...	0	0	0	0·37	0·11
September ...	0	0·38	·02	4·60	2·50
October ...	3·98	3·10	5·40	4·0	1·50
November ...	9	11·0	4·0	1·80	11·10
December ...	5	1·0	5·0	0·40	6·0
Total for year...	27·98	33·66	36·32	34·12	50·21

The same fact also to some extent accounts for the exceptionally large amount of sunshine, which is to be regarded as one of the outstanding features of the climate of Algeciras, as indeed of southern Spain generally. The number of hours

of sunshine averages over 3,000 annually, whereas few of the English health resorts average more than 2,000. Now of all factors which go to make up the essentials of a good winter climate for English people it will readily be conceded that none are so important as abundant and strong sunlight. Whether for the invalid recovering from acute disease, the sufferer from chronic wasting disorders of any description, or the subject of overwrought brain and nervous prostration, as well as many other morbid states, sunlight, with its associated warmth, can generally be trusted to do more than all the various resources of the Pharmacopœia.

But probably it is not so much by the sick as by the sound that Algeciras will be sought after as a place of residence in winter. Those who are disposed to spend whole days out of doors in the country, on sporting expeditions, in shooting, in fishing, in following the fox, or in golfing—to these also the luxuriance of the sunlight will usually be no less welcome as a contrast to the depressing fogs they have left behind them in England.

In Table II. an attempt has been made to draw a comparison between the climatic conditions of Gibraltar and those of Netley, which latter may be taken as fairly representative of the south coast of England. An idea may thus be gathered as to the advantages possessed by the former over the latter, whether as a health station for invalids, or as a winter residence for those who desire simply to escape the rigor of the more northern latitude. The figures speak for themselves.

TABLE II.—AVERAGE OF FIVE YEARS, 1896-1900.

	Air pressure corrected to 32° F.	AIR TEMPERATURE				Relative humidity—mean per cent.	Mean amount of cloudiness	WEATHER					
		Mean of minimum	Mean of maximum	Mean of means	Abs. min.			Annual rainfall	Rain (in days)	Fog	Clear sky	Overcast	Gales
Gibraltar	29·987	58·c6	71·0	64·0	36·8	70	4·2	32·22	74	1	123	65	13
Netley ...	29·879	41·2	62·3	51·7	18·7	76	6·6	32·97	145	10	19	140	46

It may not be out of place to make some reference also to the disadvantages under which Algeciras is placed in comparison with other modern health resorts. These may almost be summed up in the primitiveness of the surroundings, the lack of modern development observable in town and country, and especially the unsuitability of most of the roads for carriage traffic. To many, however, these only constitute an added charm. The architectural features of the streets and buildings are not imposing in a modern sense, yet the town is not devoid of interesting relics in the shape of old churches and Roman and Moorish remains, which are well worthy of study, and fascinate all lovers of antiquities. The old Moorish aqueduct which still carries the water supply of the town is said to be the finest of its kind in Europe, and is a marvel of Moorish architecture. The alameda, the bull-ring, the market, and the public square, are features highly interesting and richly illustrative of the social life and customs of Andalucia of the present time.

It has been remarked, chiefly by those who have paid only passing visits to Algeciras, that there is little for visitors to do by way of diversion and amusement there. It is true they cannot enjoy the daily concerts, the fêtes and the fireworks which are provided at so many English and Continental resorts; but if they are so disposed, they can indulge in lawn-tennis, cycling, golf, foxhunting twice or thrice a week with the Gibraltar pack, horse or donkey riding, picnics in the woods, &c. There are many interesting walks and rides within a few miles of the town for those who are able for such exertion. Those who have a desire for greater excitement than Algeciras provides may run over by steamer at any time to Gibraltar, and there be posted up in the latest events of the day, and witness whatever evolutions may be in progress within that busy and bustling fortress. The steamboat service between the two places is excellent.

But, as already stated, the chief merits of Algeciras consist in its restfulness, its unconventionality, its startling primitiveness, the curious mingling of modern English modes of life with the simple yet piquant ways of the Spaniards.

Algeciras, like most other health resorts, is blessed with an

obnoxious wind. The east wind (or Levanter) as it is felt at Gibraltar is undoubtedly to most people somewhat relaxing and enervating, accompanied as it generally is by a dense vapour cloud, which overhangs the Rock and deposits a heavy moisture upon the town. At Algeciras, however, its depressing influence is far less markedly felt, although occasionally the vapour cloud formed by the Rock reaches almost across the Bay, and its peculiar properties are then conveyed in some degree to the dwellers in Algeciras. The deleterious effects of this wind are, however, apt to be greatly exaggerated; some persons even preferring it to any other wind. The depressing effects are due in my opinion not so much to increase of watery vapour in the air as to the exclusion of direct sunlight by the interposition of the cloud above referred to, and the consequent cutting off of the eminently vivifying influence possessed by the full flush of the sun's rays. The coincidence of easterly wind with obscured sunlight and a dull and depressing state of the atmosphere may be noted in many climates. The condition is well depicted in the lines:—

> "The east wind had whistled for many a day,
> Sere and wintry o'er summer's domain,
> And the sun muffled up in a dull robe of grey,
> Looked suddenly down on the plain."

Fortunately for Algeciras and Gibraltar, this Levanter cloud, which sometimes assumes the form of a thick, black mantle, is chiefly prevalent, as stated, in the summer months, when its presence as a protection against the glare of the subtropical sun is, to most people, more grateful than otherwise.

As a centre from which to visit the sights of southern Spain—Ronda, Malaga, Granada (with the Alhambra), Seville, Cordova, &c., and also Tangier and Ceuta in Morocco—Algeciras offers every facility. The Railway Company have drawn up a series of tours occupying from a few days to several weeks, and Cook's agents have also instituted their excursions over the same routes. These are now largely patronised, especially by English and Americans.

THE PAYMENT OF INSTITUTIONAL PRACTITIONERS.

BY CHARLES J. WHITBY, B.A. M.D.CANTAB.

THE point raised by Dr. Bampton in his paper on contract medical fees in hydropathic hotels is one which merits consideration, but it would seem that he writes from the outside, as his argument is based on a fallacious assumption. As a matter of fact, the charge nominally made at "hydros" for medical attendance is only a part, usually an inconsiderable part, of the remuneration actually received by the resident physician. Hydropathic establishments (whether they call themselves "hotels" or not) are really comparable rather to boarding-houses than to hotels properly so called, as the meals are served at fixed hours and the same food is provided for all. The terms charged are, however, usually higher at a hydro than at a boarding house of the same class, and necessarily so, as all the receipts are taken in order to provide the salary of the medical man. He accordingly receives a fixed minimum stipend, which in most cases is, I think, at least as well proportioned to the services rendered by him as is the remuneration of the average general practitioner. If he were to depend entirely on the amount *nominally* charged for his services he would indeed fair badly, but he usually gets far more than this. Dr. Bampton's assertion that not one in twenty of the visitors goes in for hydropathic treatment may be true of one or two of the most degenerate establishments (some of those in particular which are situated in large towns and not in country districts), but it is certainly incorrect as a description of the majority of hydros where a capable resident medical man is employed.

At such establishments it will be found that the number of patients equals or exceeds that of mere visitors, and, speaking with an experience of many years, I unhesitatingly deny that these patients are usually hypochondriacs or *malades imaginaires.* On the contrary, genuine hypochrondria is rarely

met with at such places, simply because experience proves that this disease is not benefited by the treatment. Neurasthenia (a very different and a very genuine malady) is often treated and often cured at the better class of hydropathic establishment. Even if the amount nominally paid for medical attendance at hydropathic establishments were the whole remuneration received by the physician for his services, it would not be so little as at first sight appears. Generally speaking, a patient once examined and prescribed for, needs little further attention, and, on the average, does not see the doctor more than once or twice a week. The average duration of the patient's stay will not work out at more than a fortnight. However, these are minor considerations; the main point is that the medical fees are only a fraction of the payment actually made.

The remedy proposed by Dr. Bampton for the state of affairs which he, naturally, but mistakenly, imagines to obtain, is that the visiting medical man (or resident one, I presume, if such exist) should charge for his attendance on each case in the ordinary way. This would only result in the extinction of such medical functions (and they are important) as are still discharged by the better class of establishment. The public insists upon an *inclusive* charge. I would never patronise an establishment where it remained uncertain what expense would be incurred. If any change be made it should rather take the form of abolition of all separate charges for medical attendance, as the present system may give rise to the misapprehension that the medical services rendered are not paid for at their proper value. At the private sanatoria for consumptives it is the rule to charge a certain sum per week, and this sum covers medical attendance. But such sanatoria admit no mere visitors. At hydros (the good ones at any rate), though some are not patients, all share in certain advantages inseparable from the curative purpose of the place—plain, wholesome food, regular hours, bathing facilities, healthy situation, &c.—so that it seems just that all should contribute to the expense of retaining the supervisory services of a physician. At the same time it also seems just that, as is now the case, those who more freely avail themselves of these advantages should pay most. In fact,

the present system is upon the whole much more equitable than it appears to an outsider unacquainted with all the elements of the problem; and an alternative is by no means easy to suggest.

I agree with Dr. Bampton that when a visitor expresses a desire to see any particular medical man no obstacle should be allowed to arise. But this will happen very very seldom in any establishment where the attached physician is a competent and specially experienced man, because the vast majority of invalids who visit hydros come for the purpose of availing themselves of the special facilities of the place. "Strict hydropathy," says Dr. Bampton, "has been found not to pay." Hydropathy, however, as we all know, is dead, and hydrotherapeutics, or rather physical therapeutics, reigns in its stead. This branch of medical art has an immense future before it, and only those who have had the advantage of testing its curative powers can fully appreciate its efficacy when rightly and skilfully employed. In England, unfortunately, hydrotherapeutics has as yet achieved no official recognition worth mentioning. In Germany, thanks to the labours of Professor Winternitz and other eminent men, its just claims are fully recognised, and so, doubtless, will they be with us in due time. Meanwhile, we who, in the face of immense difficulties, are doing our best to further what we believe to be the cause of therapeutic progress must be content with the satisfaction of seeing our patients get benefit which, in many cases, we believe they could have obtained by no other method.

I agree with Dr. Bampton that medical men should not allow their names to appear in the local advertisements of establishments with which they are officially connected. In medical journals such announcements appear to me quite unobjectionable, nor do I see any ethical impropriety in the bare announcement of the name of the resident physician in advertisements in the general press. But I have, as a matter of fact, discountenanced the use of my own name in *all* lay advertisements with which I have of late years been connected.

[Although we do not court controversy in these columns, we have thought it just to insert the above very fair and very temperate rejoinder to Dr. Bampton's paper.—Ed.]

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

A GENERAL Meeting was held at 20, Hanover Square, on Wednesday, October 29, 1902, at 8.30 p.m., the President, Dr. DOUGLAS KERR (Bath) in the Chair.

PROPOSED ALTERATION OF RULE 51.

Dr. GEORGE THOMPSON (Buxton) proposed the following alteration of Rule 51 :—

"The President, together with four Vice-Presidents and ten Councillors who have attended the fewest meetings of Council, shall not be eligible for re-election to their respective offices for one year ; but the retiring President shall become a Vice-President for life, without a seat on the Council (unless re-elected to the Council by the Society) so long as he shall remain a Fellow of the Society."

Dr. SOLLY (Harrogate) seconded the proposition.

The PRESIDENT, in reply to a question by Dr. Ewart, said the chief point in the alteration was that at present the President and many of the Vice-Presidents retiring from active participation in the Council's deliberations became Vice-Presidents for life ; the alteration suggested would lead to a limitation of the number of those Vice-Presidents. He understood there were duplicate lists in the Society ; the names of some Fellows might appear as a President, a Vice-President, as a Member of Council, and also as a Fellow of the Society. The numbers were increasing to such an extent that some such limitation as that proposed in the resolution was thought desirable. In other words, it would limit the number of Vice-Presidents in the future.

The resolution was carried unanimously.

The PRESIDENT expressed his regret that the Treasurer's Report with the Balance Sheet must stand over until a further meeting, as only one of the Auditors had signed the accounts.

Dr. Snow thought the meeting should be informed, for the satisfaction of members, that the finances were in a very satisfactory condition. Three years ago he was somewhat nervous about them, but there was no cause for such a feeling now.

The Treasurer (Dr. Harry Campbell) in response to the President's request, said the excess of assets over liabilities was £21 7s. 1d., so that the Society was in a perfectly solvent condition.

Dr. Douglas Kerr then introduced to the meeting the President-elect, and retired from the Chair.

The Chair was then taken by the new President, E. Symes Thompson, M.D., F.R.C.P., who returned thanks for his election.

Dr. Ewart proposed, and Dr. Snow (Bournemouth) seconded, a vote of thanks to the retiring President.

Dr. Douglas Kerr replied.

Dr. Burney Yeo proposed, and Dr. Braithwaite (Buxton) seconded, a vote of thanks to the Treasurer and Auditors.

Dr. Harry Campbell and Dr. McLure replied.

Dr. Robert Lee proposed, and Dr. Mouillot (Harrogate) seconded, a vote of thanks to the Council.

Dr. Ward Humphreys replied.

A vote of thanks to the Librarian was proposed by Dr. Percy Lewis (Folkestone), seconded by Dr. John F. Woods, and acknowledged by Dr. Morgan Dockrell.

A vote of thanks to the Secretaries was proposed by Dr. Bowen Davies (Llandrindod Wells), seconded by Dr. Gage Brown, and acknowledged by Dr. Sunderland.

The business of the General Meeting then terminated.

Copy of Minutes.

An Ordinary Meeting was held at 20, Hanover Square, on Wednesday, October 29, at 9.15 p.m., the President, Dr. Symes Thompson, in the Chair.

The minutes of the last Ordinary Meeting were read and confirmed.

The following candidates were nominated for ballot at the next Ordinary Meeting.

Percy Newell, L.R.C.P. & S., Crowborough.
Nicolas Elrington, B.A., L.R.C.P., M.R.C.S., Leamington.
Percy Athelstan Nightingale, M.D., Harrogate.
David Hugo Daniell, L.R.C.P. & S., London.
John Morgan Owen, L.R.C.P., M.R.C.S., Fishguard.
Douglas A. Reid, M.D., M.R.C.S., Tenby.
Ernest Mansford Knowling, M.B., B.A., M.R.C.S., Tenby.
George R. E. Bonsall, L.R.C.P. & S., Aberystwith.
Lionel Alex. Weatherby, L.R.C.P. & S., Bath.
Ernest E. Lewis, M.D., M.R.C.S., L.R.C.P., London.
William Henry Hewlett, M.D., D.P.H., Wivenhoe.
Henry Edmund Symes Thompson, M.A., M.R.C.S., L.R.C.P., London.

The following candidates were put up for ballot, and were unanimously elected.

Bertram Watson, M.D., M.R.C.S., Harrogate.
Alfred Hollis, M.D., Freshwater, Isle of Wight.
Gordon E. Oddin Taylor, M.R.C.S., L.R.C.P., Pietermaritzburg.
Thomas Buxton Flint, M.R.C.S., L.R.C.P., Buxton.
Christopher Vise, M.D., M.R.C.S., Tunbridge Wells.
Philip Barnett Bentlif, M.R.C.S., L.S.A., St. Heliers, Jersey.
John Griffiths, M.R.C.S., L.S.A., Llandrindod Wells.

The PRESIDENT then read a most instructive and learned address, entitled "Far-away Climates."

Dr. BURNEY YEO proposed, and Dr. SOLLY seconded, a vote of thanks to the President for his address.

Dr. FORTESCUE FOX having put the vote to the meeting it was carried unanimously and acknowledged by the PRESIDENT.

THE PRESIDENT'S VALEDICTORY ADDRESS.

The PRESIDENT (Dr. Douglas Kerr) said the time had now arrived for him to vacate the Chair, and he desired to take the opportunity of thanking one and all for the courtesy, kindness and help, which he had received during his year of office. In the course of his short address when taking the Chair, he ventured to say he felt sure of that support, and he now very heartily acknowledged it. He would ask his successor, Dr. Symes Thompson, to take his place, and in

doing so he felt he was representing the whole of the Fellows in extending to him a very warm welcome. Dr. Symes Thompson's standing in the profession rendered it unnecessary to say anything beyond the few words of introduction. It might not be generally known that at the birth of the Society a great debt of gratitude was owing to Dr. Symes Thompson. Dr. Miller Ord was to have read the first address before the Society, but in consequence of a family bereavement was unable to do so at the last minute. Almost at a moment's notice Dr. Symes Thompson, without preparation, but in a most satisfactory manner, filled the gap, and relieved what would have been a most uncomfortable situation. He believed the provincial Fellows, as well as Dr. Symes Thompson's London colleagues, would feel that no more suitable representative in London could have been found to fill the Presidential Chair.

Dr. SYMES THOMPSON then took the Chair, and briefly returned thanks.

Dr. WILLIAM EWART proposed a hearty vote of thanks to Dr. Douglas Kerr, for the admirable manner in which he had carried out the duties of President during the past year. He said the success and prosperity of the Society had been equal during the past year to any which preceded it. He was particularly concerned with the position the Society occupied, and which it was improving upon year by year, and much of that progress had been directly due to the President for the year. He felt sure all would look back to Dr. Douglas Kerr with great respect and gratitude; and one could not forget that he had brought to the front, in the annals of the Society, one of the most ancient of health resorts.

Dr. SNOW (Bournemouth) seconded the resolution, and said all would look back with kindly recollections over the term of Dr. Kerr's presidency.

The resolution was carried by acclamation.

The PRESIDENT remarked that Dr. Kerr had been present at every meeting, and had only once been absent from a Council meeting, and on that occasion the cause was illness. seeing that Dr. Kerr lived more than 100 miles from London,

that would show the measure of his devotion to the work. He only hoped that he would himself be able to vie with that record, living so near as he did to the place of meeting.

Dr. DOUGLAS KERR, in a sentence, acknowledged the kind thanks of the Society.

VOTE OF THANKS TO THE TREASURER AND AUDITORS.

Dr. BURNEY YEO said the handsome balance which the Treasurer had announced, entitled that gentleman to the very warmest thanks of the Fellows. He trusted that the consciousness of having a large balance in hand would not lead the Society into extravagances. Inasmuch as one of the auditors had not yet signed the balance sheet, Dr. Yeo felt some embarrassment in including the auditors in the vote, but if gratitude was a lively sense of future favours he might confidently do so.

Dr. BRAITHWAITE (Buxton) seconded the motion, and it was carried.

Dr. HARRY CAMPBELL (Treasurer) and Dr. MCLURE (Auditor) acknowledged the vote.

THANKS TO THE MEMBERS OF COUNCIL.

Dr. LEE proposed, and Dr. Mulliot seconded, a hearty vote of thanks to the members of the Council, and it was carried.

Dr. WARD HUMPHREYS acknowledged the vote, and attributed much of the success of the Society to the deservedly sharp eye which members of Council kept on one another.

THANKS TO THE EDITORS OF THE JOURNAL.

Dr. GROVES (Carisbrooke) proposed this resolution, and expressed high appreciation of the work done by Dr. Leonard Williams and Dr. Sunderland.

Dr. PAGE MAY (Helouan) seconded the motion, and in doing so said the printed matter issued by the Society was very well done and extremely important.

Dr. LEONARD WILLIAMS, in thanking Fellows for the vote, said the only difficulty experienced by his coadjutor and himself in the management of the Journal was, that the zeal of

the Fellows in various parts of the country did not come up to their zeal in the matter of attendance at the meetings, so that the Editors had often to supply matter to the Journal which might very profitably have been supplied by others at a distance.

Thanks to the Librarian.

Dr. Percy Lewis (Folkestone) proposed, and Dr. Woods seconded, a vote of thanks to the Librarian, which was carried and acknowledged by Dr. Morgan Dockrell.

Thanks to the Secretaries.

Dr. Bowen Davies (Llandrindod Wells) proposed, and Dr. Gage Brown seconded, a vote of thanks to the Secretaries.

Dr. Sunderland responded for himself and Dr. Shirley Jones.

The President then read his Inaugural Address.

Dr. Burney Yeo said he was sure it was the wish of the Fellows to return to the President, Dr. Symes Thompson, their best thanks for the excellent paper to which they had just listened. In a book by Jules Verne one was carried round the earth in eighty days, but the President had just accomplished the task in forty minutes. He noticed in the paper mention was made that we might travel at 200 miles an hour. That would certainly be very trying to the nerves of some of the patients; but it did not require too great an effort of the imagination to believe that a century hence the President might be inviting the Fellows to consider sending patients, not by sea or by rail, but by air, and pointing out the suitable parts of the planet Mars where patients might be set free from their earthly troubles. He was sure the President would be accorded the warmest thanks of the Fellows for his most admirable and instructive Address.

Dr. Solly seconded the vote, and referred to the first address delivered by Dr. Symes Thompson before the Society.

Dr. FORTESCUE FOX, in supporting the motion, said he would like, on his own behalf and that of the Fellows of the Society, to emphasise still more the sense of indebtedness to the President for his most admirable Address. He could not remember listening to an Address before the Society which seemed more full of valuable points and suggestiveness. It would bear the prolonged consideration of Fellows when it appeared in the Journal. Fellows had had their vision enlarged, and perhaps it was time, and he trusted the President, during his year of office, would continue to enlarge it in matters scientific. He put the resolution to the meeting, and it was carried by acclamation, the President replying.

VISIT OF THE BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY TO THE NORTHERN SPAS,

Visiting Matlock-Bath, Dovedale, Rowsley, Chatsworth, Haddon Hall, Buxton, Ilkley, Harrogate, Scarborough and Woodhall Spa : leaving London Saturday, April 25, 1903.

THE cost of the entire tour will be £13 5s. each, or with first-class travelling throughout, £14 14s. Either the first half or the second half of the tour may be taken separately. The cost of the first part of the tour from London to Matlock and Buxton and back to London (including the accommodation specified in the itinerary) from Saturday, April 25, to breakfast on Thursday morning, April 30, will be £7 7s., with third-class railway travelling, or £8 8s. with first-class railway travelling. The cost of the second part of the tour, from London to Harrogate and back to London (including the accommodation as specified in the itinerary, commencing with dinner at Harrogate on Thursday, April 30, and taking the remaining accommodation as given on the following days, up to and including breakfast at Woodhall Spa on May 5), will be £7 7s. with third-class railway travelling, or £8 8s. with first-class railway travelling.

The sums specified include accommodation at first-class hotels, consisting of *table d'hôte* breakfast, lunch, dinner, bedroom, lights and service, commencing with dinner on Saturday, April 25, and terminating with breakfast on Tuesday, May 5 (in the case of those who take the entire tour), carriage excursions (landaus) as specified, expenses of visiting various places of interest, fees to drivers, hotel and railway servants, conveyance of passengers and baggage between stations and hotels, and service of representatives to accompany the party and see that the arrangements are properly carried out.

ITINERARY.

Saturday, April 25th.—The party will leave London (St. Pancras Station) at 4 p.m., travelling by the Midland Railway

Company's picturesque route to Matlock, arriving in time for dinner.

Sunday, April 26th.—Carriages will be provided for a most delightful day's drive to Dovedale. The route is through Cromford, Grange Hill, and Tissington, a distance of fourteen miles.

Monday, April 27th.—Will be spent at Matlock.

Tuesday, April 28th.—Leave Matlock by train about 11 a.m. for Rowsley, arriving about 11.15, where carriages will be in readiness for a drive to Chatsworth and Haddon Hall. Lunch at hotel in Chatsworth. Leave Rowsley about 4.30 for Buxton, arriving in Buxton about 5.30.

Wednesday, April 29th.—To be spent at Buxton. Carriages will be provided for visiting places of interest.

Thursday, April 30th.—Leave Buxton for Ilkley and thence for Harrogate, arriving in time for dinner.

Friday, May 1st.—To be spent at Harrogate, visiting the various places of interest in the neighbourhood, leaving about 6 p.m. *via* York for Scarborough, and arriving about 7.45.

Saturday, May 2nd.—Will be spent at Scarborough. Carriages will be provided for visiting the principal places of interest in the neighbourhood.

Sunday, May 3rd.—Will be spent at Scarborough.

Monday, May 4th.—Leave Scarborough about 9.15 a.m. for Woodhall Spa.

Tuesday, May 5th.—Leave Woodhall Spa about 9 a.m. for London.

Reviews and Notices of Books.

THE CLIMATES AND BATHS OF GREAT BRITAIN, being the Report of a Committee of the Royal Medical and Chirurgical Society of London. (London: Macmillan and Co., 1902.) Vol. ii.

It is as long ago as 1889 that the Royal Medical and Chirurgical Society, largely at the instigation of our present President, Dr. Symes Thompson, and the late Dr. W. M. Ord, appointed a committee to investigate and present in an accessible form, the facts in connection with the climatic resorts, bathing places and mineral springs of Great Britain and Ireland. At that time a great many of our most favoured climatic stations and most valuable mineral springs were languishing in the cold shades of neglect, while continental places, no whit more favoured by Nature and possessed of mineral springs in no sense more valuable, were growing sleek and prosperous by reason of their popularity in this country. It was with a view of doing something to redress this undesirable balance that the committee was instructed to undertake the work, and one of the results of the movement thus started was the foundation of the British Balneological and Climatological Society.

The first volume of the report was issued in 1895, and it received in the Journal an exhaustive notice from the pen of the late lamented Dr. Hyde, who clearly appreciated the value of an authoritative and industriously compiled pronouncement upon the then condition of some of our home stations. On looking through this volume for the purposes of this review, one is immediately struck by the differences which have been brought about in the intervening period of some ten years. And these differences are all to the good. Places, such as some of the Welsh spas, which were then considered of small account, have grown into stations of considerable and ever-increasing importance, and this movement, more or less pronounced in degree, is discernible all along the line.

The fact is, the laudable desire to restore the British health resorts has been instrumental in bringing into prominence the chief reasons for their neglect and decay. Among these, the one which stands out most conspicuously is the utter lack of enterprise, the complete misconception of the demands of the situation, displayed by those responsible for the government and progress of these places. The profession ceased to recommend the home stations and the public to be attracted by them, largely, if not entirely, because the stations themselves had ceased to

deserve recommendation and ceased to provide attractions. Rest and change are all important in climatic and spa treatment, but where rest spells boredom and change becomes synonymous with discomfort, the prescription is not one which a physician cares to give nor a patient to accept. This lesson, which is writ large on a reperusal of the first volume, is strengthened and reinforced by a study of the second volume. If home stations desire to enter into the arena of keen competition with foreign stations, as we should all like them to do, it is essential that they should not only avoid any cause for unfavourable comment, either on their drainage or their water supply, but that they should make it clear that their accommodation is good and their attractions sufficient. The time has gone by when any place can afford to trade on its natural advantages alone. In the case of many of our larger resorts, such as Bath, Harrogate, Buxton, and Cheltenham among the spas, and all the more important sea-side resorts, the traditional reproaches have long ceased to be applicable, and conspicuous among those who have recently brought themselves well up to the level of all modern requirements may be mentioned Leamington and Sidmouth. The second volume nevertheless affords much food for laments over wasted opportunities and for the awakening of anxious thoughts for the future. The large number of places considered deserving to rank as health stations whose drainage is under suspicion and whose water supply is deficient, either in quality or quantity, is still incredibly large, and if the volume were possessed of no other merits it would still be valuable as showing such places in their true colours. Every badly-managed health resort is a menace to the reputation of health resorts as a class.

Of the volume itself it would be difficult to speak too highly. The climate of London and Middlesex is very ably and exhaustively dealt with by Dr. William Ewart in a section reaching to eighty-one pages. There might be some doubt as to the propriety, on general grounds, of including London among our health resorts, but if death-rate be taken as a criterion, then it certainly would have been improper to exclude it, and whether the district can claim to rank as a health resort or not, no one, we feel sure, would like to be deprived of Dr. Ewart's interesting and instructive contribution to its climatology and special conditions.

The section on the East Coast is from the clear and pleasing pen of Dr. William Murrell, who is a master in stating bald facts baldly, and withal in a manner which is conspicuously acceptable.

The section on the Midland Counties, contributed by Dr. P. Horton-Smith, cannot be regarded as altogether satisfactory. The area thus comprised, *i.e.*, "all those counties which possess no true coast-line of their own, but are separated from the

sea-board by intervening shires," is much too large to be included in a single notice. The author has doubtless done his best with very unsatisfactory material, but the nature of his task rendered it certain that his facts and conclusions would be of a nature far too general and superficial to be of much practical value. The references to individual stations such as Malvern, Clifton, Leamington and Cheltenham are good so far as they go, but they scarcely suffice for the importance of these places. It is right, however, to add that the two last named, so far as their waters are concerned, were fully and ably considered in the first volume by no less an authority than Dr. A. E. Garrod.

The section on Lancashire by Dr. Robert Maguire is also somewhat meagre, and we feel that the notices of such places as Blackpool, Southport and St. Anne's might with great advantage have been amplified, so as to include at least some references to the drainage and water supply of these important and much frequented stations.

The remaining sections relating to England, viz., the Lake District, by Dr. H. L. Brooksbank, and Northumberland, Durham and Yorkshire, by Dr. Lazarus-Barlow, are, both of them, fully and admirably executed. Of quite exceptional merit is Dr. Lazarus-Barlow's very complete, veiy instructive, and highly interesting review of the climatic resorts in the counties which he has undertaken. The whole section is a model of what such work should be.

Wales has been divided for the purpose of this Report into North and South. The division is not only convenient, but it is more or less correct climatically. The northern portion has been admirably done by Dr. D. J. Leech, who, while giving the climatic element its due prominence, nevertheless enters into most commendable detail with regard to the sanitary condition of the individual places in his district. South Wales is from the pen of Dr. C. T. Williams, an acknowledged authority upon all matters climatic and meteorological.

The climate of Ireland is well discussed by Sir J. D. Moore, M.D., and a consideration of its mineral springs (of which Lisdoonvarna appears to be the only representative) is contributed by Dr. Norman Moore.

In a volume thus so complete otherwise, there is one omission which is as notable as it is strange. This is the absence of all reference to the many important climatic stations in Scotland, due, the Committee informs its readers, to the absence of sufficient local co-operation. Our friends across the Tweed are not generally slow in appreciating the commercial side of a transaction, and their failure to realise what exclusion from such a work as this may mean to the popularity of some of their stations is difficult indeed to account for.

Regarded as a whole the two volumes represent a gallant and by no means unsuccessful attempt to codify and classify such knowledge as was available concerning British health resorts and British climatic stations, and the work constitutes a book of reference of the highest value to all who concern themselves with these branches of knowledge.

ACUTE DILATATION OF THE STOMACH. By H. Campbell Thomson, M.D.(Lond.), F.R.C.P., Assistant Physician to the Middlesex Hospital, &c. (London: Baillière, Tindall and Cox, 1902.)

This little fifty-four page book is a very remarkable contribution to medical literature. The subject of which it treats is so little known and so imperfectly understood that the vast majority of text-books pass it over in silence, while in so recent and so exhaustive a work as that edited by Professor Clifford Allbutt, it is accorded the bare recognition of a couple of pages. A perusal of the facts which Dr. Campbell Thomson has collected from his own experience and that of others will convince anyone that the condition is nevertheless by no means uncommon and is one of which every practitioner should remember the existence, so as to guard against its too often fatal termination. It is rather startling to have to realise, as anyone reading this book must do, that there is a morbid condition, comparatively easy of recognition, and in its early stages comparatively easy of arrest, which, as a rule, takes its course unrecognised, and therefore untreated, to a rapid and painful dissolution. Yet the evidence in favour of this conclusion is absolutely overwhelming, so that the sooner the profession becomes alive to the fact and sets to work to remedy the prevailing ignorance on the subject the better for everyone. Dr. Campbell Thomson writes clearly, forcibly and convincingly, with a modesty, all too uncommon, as to his own share in dragging this spectre from the obscurity which it has so long enjoyed. He has collected all the recorded cases of the condition, which he here examines fully, though not lengthily, with true scientific instinct and accuracy. There then follows a careful examination into the etiology, which is still obscure and thoroughly deserving of further investigation. The symptoms and physical signs are well described, and every experienced reader will probably recognise in the picture which the author presents, the real solution of several cases of baffling obscurity with which he has met. The importance of this section is very considerable, in that it teaches us what to look for and how to look for it, when once we have realised the existence of the condition. The sections on pathology, morbid anatomy, course and prognosis, and treatment are all thoroughly well executed, and the illustrations are exceedingly helpful.

In view of the prevailing ignorance with regard to the con-

dition of which it treats, of the importance of the subject, and of the desirability for further research, it is impossible to write too emphatically of the necessity for the widest dissemination of the facts and suggestions contained in this little book. The author brings to his task not only the instincts and methods of the true investigator, but a clearness and simplicity of exposition which render the work as agreeable as it is instructive.*

DOLLE'S AROMATIC IRON MILK. (The British Iron Milk Syndcate, 115 and 116, Strand, W.C.)

This preparation, which was born in the Fatherland, where for some years it has enjoyed a considerable success, has recently been placed on the English market. Its name is very appropriate. From its appearance alone it would be quite impossible to distinguish it from ordinary cow's milk, while its tastelessness permits of its being added to the latter without very materially affecting the taste. It consists of the pyrophosphate of iron suspended in water with glycerine, spirit and aromatics. The advantages over other iron preparations which are claimed for it, namely, absence of dental blackening, of tendency to dyspepsia and of constipating effects, are due to the facts that the pyrophosphate is a salt altogether devoid of astringency, and that it escapes decomposition by the internal secretions until it reaches the small intestines, where it is rapidly taken up by the lacteals and introduced into the circulation through the thoracic duct. An extended opportunity of testing these claims has left us with the conviction that they are not exaggerated. The teeth are not blackened, the stomach is not upset, and constipation is not occasioned by the administration of iron milk over considerable periods of time; whereas the hæmoglobin value of the blood is increased, the appetite is heightened, and the general nutrition improved. Some of these results may perhaps be attributed to the presence of phosphorus, an element which is admittedly difficult of exhibition in a readily assimilable form. We have no hesitation in recommending this attractive and palatable preparation to the notice of our readers as a reliable and rapidly acting preparation where the tonic effects of iron and phosphorus are indicated.

GRANALT: a Dry Malt Extract. (Thomas Christy and Co., 4, Old Swan Lane, Upper Thames Street, E.C.).

This is a preparation which has been designed with the very laudable view of superseding the treacly-looking liquid

* On the subject of gastric dilatation generally, attention may profitably be directed to a paper by Dr. Robert Saundby, appearing in the *British Medical Journal* of November 29, 1902.

with which the term "malt extract" has become associated. The new form is emphatically what the Americans would call an "elegant preparation." It is a brownish-yellow powder of scaly appearance with a pleasant smell and agreeable taste. In its pure state, compared with the ordinary liquid, its diastasic power is as 140 to 100—a great advance when the smaller bulk and greater ease of handling is taken into account. The ordinary malt extracts are seldom combined with anything except cod-liver oil. Granalt, however, is easily combined with various drugs, and we have seen samples of the new preparation in combination with quinine ferrocitrate, calcium hypophosphite, calcium glycerophosphate, cascara, and castor-oil. Experience with many of these in out-patient practice enables us to speak very highly of them. Their pleasant taste and attractive appearance enables them to be given on bread and butter and in other ways which do not suggest the administration of medicine. This is obviously of very special advantage in treating children, for whom these preparations are peculiarly well suited. The castor-oil preparation in particular may be mentioned as one which deserves a trial at the hands of everyone whose work brings him into contact with delicate children. All the Granalt preparations are exceedingly well prepared, and the drugs with which they are combined certainly lose nothing in efficacy from the association with attractiveness and palatability.

THE SELECTION OF CONSUMPTIVE CASES FOR SANATORIUM TREATMENT. By T. N. Kelynack, M.D., M.R.C.P. (London: The Scientific Press, Ltd., 1902). Price 6d.

This little pamphlet is, in our judgment, not quite suitably intituled. From its name one is justified in supposing that it is devoted mainly to affording assistance in the admittedly difficult task of selecting from among tuberculous cases those most suitable for sanatorium treatment; whereas it is really a disquisition which covers nearly the whole duty of man, layman no less than physician, on the subject of tuberculosis. The author is, in fact, expounding a gospel or advocating a policy. This he does, in the main, exceedingly well; with some excess of rhetoric, perhaps, but clearly, forcibly, and as one who is familiar with his subject. The policy has the merit of thoroughness in principle, but it has also the defect of utter impracticability. Among the articles of faith which appear on page 8, we find that all persons predisposed to tubercular infection are to be "recognised" and "protected," but we are not informed how recognition is to be secured nor by whom the protection is to be undertaken. The next item is "The Detection of the Earliest Manifestations of Consumption." This, no doubt, is highly desirable, but its attainment involves as a condition

precedent an amount of special experience and a degree of diagnostic skill in every member of the profession, which the present five years' curriculum, even if extended to seven, would scarcely suffice to ensure. There is a great deal more of this kind of thing in the twentyfive pages which comprise the pamphlet, whose great defects are obviously those incidental to a deficient sense of proportion, and to a curious absence of humour.

THE SCHOTT METHODS OF THE TREATMENT OF CHRONIC DISEASES OF THE HEART: with an Account of the Nauheim Baths and of the Therapeutic Exercises. By W. Bezley Thorne, M.D., M.R.C.P. Fourth Edition. (London: J. and A. Churchill, 1902.) Price 6s.

The fact that it has been found necessary to produce a fourth edition of this book within seven years of its first appearance is sufficient testimony not only to the interest which the subject holds for the profession, but still more, perhaps, to the satisfactory manner in which it is handled. Dr. Bezley Thorne, like all true enthusiasts, has the courage of the pure and simple faith which is in him, but, in contrast to a great number of enthusiasts, he expresses that faith in language which is well chosen, in a style which is dignified and restrained. Of the book itself it is not necessary to say aught in praise. It has been the means of compelling the attention of the profession in this country to the methods of treatment with which the names Schott and Nauheim are indissolubly connected, and in so doing it has rendered a great service not only to the profession but to the public. It may be said with safety that had it not been for Dr. Bezley Thorne and his enlightened enthusiasm, few, if any, of our British health resorts would, even by this time, have instituted those baths and exercises on the Nauheim plan by which, if we may judge from their advertisements, they now set such store. The present edition is on precisely the same lines as those preceding it, with the addition of new matter, some of which is theoretical, concerning blood-pressure, and some of which is practical, relating to the very important question of after-cures. No one who wishes to keep abreast of modern cardiac therapeutics can afford to neglect a careful perusal of this book, and however difficult such a one may find it to accept all the author's conclusions, he cannot but be grateful both for the matter and the manner of the work.

THE OFFA VENTILATOR. (The Offa Ventilating Company, 64, Basinghall Street, E.C.)

The "Offa" is an inlet ventilator, and is placed low down in the wall but not less than a foot from the floor.

It consists essentially of a flat metal plate in front of an

opening in the wall, the plate being somewhat larger than the opening. The result is that the air entering the room is diffused in all directions except forward so that no draught can be felt from it. The plate slides on pins so that it can be partially or wholly closed by merely pushing it in, and in the latter case it is practically flush with the wall.

It has several distinct advantages over the older types of ventilators, which throw the air up, as with them a draught is often felt, the air either being deflected from the ceiling on to the head or making a course in one stream straight to the outlet without properly ventilating other parts of the room. Also, with this ventilator there is no place where dust can settle, and all parts are easily accessible for cleaning.

The device is well worthy of the attention of those interested in such matters, which in these days should include every member of the profession.

Notes from the Spas and Sea-side Stations.

ALDERNEY.

Alderney is the third smallest of the four Channel Islands. It is situated 20 miles north east of Guernsey and is only 7 miles from the French coast.

The Island is 3½ miles long and 1½ miles wide.

The town in the centre is 260 feet above sea level and houses most of the civil population, numbering 1,600 persons.

There is a garrison quartered at Fort Albert and other Forts, which are built round the island at various points of vantage.

The climate is very bracing and equable, being mild in winter and the constant winds which blow in the summer keep the air cool.

Anæmic and consumptive patients do extremely well there. All such invalids that have stayed at the island have derived great benefit from the pure sea air.

The place is strongly recommended for patients who can get about and do not require much nursing, especially those who are debilitated from over-work, anæmia, or phthisis. There is none of the latter disease amongst the residents.

There are no "Sanitary Institutions." The patients have to live at the hotels or lodging houses, all of which are very cheap.

The Alderney steamer meets the Weymouth and Southampton packets every Tuesday, Thursday and Saturday in the summer, and Tuesday and Saturday in the winter.

There is another route (*viâ* Cherbourg) but this is not recommended to ladies.

PAIGNTON.

Paignton, "the most rising town in Devonshire," lies on the south coast almost in the middle of Torbay. Situated but a little over two miles from Torquay, it enjoys in its climate all the advantages of the latter place, but at the same time,

from its more open and less land-locked position in the bay, it is considerably more bracing.

Its rise within the last two decades into well-deserved public favour has been almost phenomenal. From an old world country town dating its beginnings from the eleventh and twelfth ceuturies it has passed in less than five and twenty years into the very front rank of the many splendid watering places of fair Devon.

Paignton is a bright, cheerful town of nearly 9,000 inhabitants. Facing the beautiful, clear waters of Torbay, with a grand view of the open Channel beyond, it has for its background and shelter an encircling series of well-wooded hills, and beyond these stretches a wide belt of magnificently undulating country, almost unbrokenly, to the very foot of the great Dartmoor itself. In winter the climate of Paignton is mild and soft, in summer there is nearly always a refreshing breeze from either moor or the open sea. The rainfall is about 32 inches. The census returns of 1901 showed that in the seven preceding years Paignton had increased its population proportionately more than any other town in the West of England.

The town itself covers a wide area, and the houses slope back in every variety of position almost from the very seashore right up into the hollows of the hills that lie behind. Its esplanade and sands have no equal in Devonshire. For more than a mile in front of the town the esplanade stretches on an absolutely straight level and forms a magnificent promenade for folks of all ages. The sea-front is a perfect Paradise for children, as there are no "dangerous places," and the long, gently sloping sands afford the finest bathing and best play-ground possible. There is no finer bathing anywhere than in Paignton.

The sanitary condition of the town is above reproach, and the present water supply is adequate and of the purest quality possible. Mindful, however, of the rapid growth of the town, the authorities are now carrying out elaborate works and bringing a magnificent and practically unlimited supply direct from Dartmoor, twenty-five miles away. When these works are completed, as they will be in less than two years now, Paignton will have perhaps the very finest water supply in the west.

Paignton is a bright and cheerful place to live in; there are always plenty of amusements at hand, and especially does it pride itself upon the activity of its social life. Almost every form of both outdoor and indoor recreation has its Club or Society, and the new park of the Queen's Club affords every opportunity for their encouragement.

High-class entertainments take place very frequently in the public buildings, and excursions can be made all the year round to the many surrounding places of interest by coach, rail or steamer. Within two miles are the best golf links in the county.

The summer season runs from May to October.

From a therapeutic standpoint the climate of Paignton is specially suited for neurasthenics and folks "run down." A brief sojourn in the place, and feelings of content and peace seem to sink into the very marrow of one's bones. One's brain is calmed, one's ruffled nerves are soothed, and following upon a day by the sea-shore a long night of deep, refreshing sleep comes as a matter of course. The air is a sovereign remedy for insomnia.

Paignton is well served by the Great Western Railway, and reaps all the benefit of the excellent service from London and the North to Torquay.

TOTLAND BAY.

This rising watering place is situated on the Solent at the western end of the Isle of Wight. The meteorological readings given cover a period of sixteen years, taken at 80 feet above sea-level for the first twelve years, and at 147 feet subsequently.

Average humidity, 82·0 per cent.

Average rainfall, 28 inches.

Prevalent wind from S.W.

Amount of sunshine has only been registered since January, 1901. To the end of July, 1,033·6 hours' duration were recorded.

The climate is equable and rather breezy, Totland enjoying the reputation of being the most bracing part of the Isle of Wight. Temperature has varied from 86° to 14°. During the sixteen years there have been only nine days with a tempera-

ture above 80°, and nine days with a temperature below 20°. Swallows and martins are usually to be seen in the second week of November, and instancing the mild weather of early winter, blackthorn was in blossom in January, 1902. February is the coldest month, August the warmest. March has on several occasions passed without a frost being recorded.

There are no special means of treatment. The chief charm of the place is its scenery and quietude, fine views are obtained from Headon Hill and High Down, the latter being about 500 feet above the sea. There is a marked absence of the usual sea-side "tripper," negro minstrels, &c., in the season, which extends from mid-July to the end of September. Hotel and lodging house accommodation is distinctly good, and many residents let their houses in the summer. The shipping passing to Southampton and Portsmouth is a feature of interest, and there are two batteries of artillery and an important school of gunnery at Golden Hill Fort. The best route from London is from Waterloo *viâ* Lymington, thence by steamer to Totland Bay or Yarmouth. Should the proposed tunnel under the Solent become an accomplished fact, access to this part of the island would be greatly facilitated.

Population, 1,500; an increase of 500 since previous census.

Death-rate about 6 per 1,000 annually. Infectious disease is rare, and enteric has not occurred, unless imported, in the writer's experience of eleven years. It is, in fact, an unusually healthy place and very suitable to children; there are good sands, and paddling does not seem to result in the bad effects which are frequently met with in hotter places. All the houses round the Bay are drained well out into the sea, and a scheme is now before the Local Government Board for discharging the sewage from the outlying houses by gravitation into the same outfall. Refuse is efficiently disposed of. There is an excellent water supply from Headon Hill, though some parts of the place are supplied by the Freshwater Water Company.

There is a very good nine-hole golf course on the Needles Down, open to visitors of both sexes, and the links are being much improved this winter to obviate crossing and to lengthen the course to about 2,700 yards. Bathing and boating are good, and there are several public tennis courts.

Notes and News.

We desire to call very special attention to the programme appearing on page 44 of the tour to some of the Northern Spas and Health Resorts which, it is proposed, should take place in the spring of this year. The great success of the movement in France for bringing home to Frenchmen the advantages of French Resorts has decided the Council of the Society to inaugurate a similar movement in favour of British Resorts. The district selected for the first tour is that which comprises Matlock, Buxton, Ilkley, Harrogate, Scarborough and Woodhall Spa. These stations will be admitted on all hands as representative and attractive, and the district has the great merit of being easily reached from London. It is also very accessible from most of the larger centres. The time of the year, namely the end of April may seem open to criticism as being unduly early, but it has been selected after very careful consideration as being more convenient for the majority of those who are likely to take part. In the case of those practising at places where there are "seasons," the end of April has witnessed the close of the winter season while the summer season has not commenced. In the case of those practising in the larger towns, especially such as are connected with teaching bodies, the same arguments apply, and this year, at any rate, there is no interference with Easter. The programme as printed is by no means final and those interested in the development of our home stations are earnestly invited to offer any criticisms or suggestions which may occur to them. These should be addressed to Dr. Leonard Williams, 8, York Street, Portman Square, W.

In the December number of the *Practitioner*, Mr. Malcolm Morris, the Editor who has conducted the paper for eight years with such conspicuous ability, makes what may be called his valedictory bow. All readers of the paper will see

this announcement with genuine regret. Mr. Morris has, during his tenure of office, raised the *Practitioner* to a position which is unique among medical periodicals. While wishing his successor (of whose identity no hint is given) every success, it is easy to foretell that his task in maintaining the present position of the paper will not be an easy one. Mr. Morris has for years contributed to the gaiety, if not of nations, then certainly of those who glance at medical literature, by his racy and often caustic animadversions on current professional topics, under the heading of the "Month," and it is to be feared that with his personality removed, these animadversions will lose much of their literary flavour, their piquancy and their independent tone, which has rendered them so refreshing. Mr. Malcolm Morris will carry with him into his retirement the good wishes of all readers of his paper.

WITH the advent of the new Editor the paper is to undergo a new incarnation, the exact nature of which is necessarily unknown at the time these lines are written. It is to be hoped that it will be nothing very drastic. The present shape, size, and printing of the *Practitioner* are all that can be desired, and after the medical weeklies, offer a great relief, more especially to those who have reached the presbyopic age. It is to be hoped, further, that the policy of devoting each number almost exclusively to some special subject will not be entirely abandoned. This policy of obtaining the views, often diametrically opposed to one another, of acknowledged experts, constitutes a feature not only of great interest but of special and permanent value. The Alcohol Number (November, 1902) is one which every thinking man should study and keep. Almost alone among medical publications the *Practitioner* has hitherto not scrupled to gibbet a bad book. Of this the issue just mentioned also affords an excellent example. The principle of leaving a mediocre book severely alone is, perhaps, on the whole a wise one, but when the work descends from the ranks of mediocrity into the regions of the dangerous or the insolent, it is well that it should be described in adequate terms.

It must be admitted that *Brain*, the organ of the Neurological Society of London is as a general rule rather too technical or specialistic for the taste of the ordinary reader. This is, however, by no means invariably the case. Occasionally there appear articles which, though necessarily neurological, are nevertheless easy of comprehension by the least neurologically instructed member of the profession. As a case in point, and also on account of its intrinsic merit and interest, attention may be called to a paper in the Autumn Number, 1902 (vol. xxv., No. 99), entitled "Pain," by James Mackenzie, M.D. The author holds that the viscera and their investing membranes, the pericardium, the pleura, and the peritoneum, are practically insensitive to pain, and that the pain experienced when these are stimulated is due to a viscero-muscular reflex. The facts and considerations by which the writer supports his view are very well marshalled and very interesting. It is a contribution to current medical literature which deserves to be well studied, and the conclusions well tested, for not only is it convincing, but it is thoroughly subversive of all that any of us have ever been taught on the subject.

In our judgment, one of the most attractive of the medical papers is the *Clinical Journal*. It is not in any sense a rival to the two great weeklies, the *Lancet* and the *British Medical Journal*, for it is given over exclusively to the publication of short papers on medical, surgical, and occasionally, special subjects. No attempt is made to convey news; there are no editorials, and no correspondence. The value of the papers necessarily varies very considerably, but on the whole they may be regarded as setting forth the main points in connection with any subject with admirable force and clearness. The majority of them are lectures to students or to local societies elaborated into "paper" form. Occasionally, of course, the matter is poor. This is the case with all journals, but it is the case with the *Clinical Journal* far less frequently than with most. And when it does occur it is almost always in connection with a lecture or paper by some

one who has attained a great name on a professional equipment which, judging from their present performances, must be remarkably slight. For those who, while wishing to keep themselves abreast of what is being taught in the schools, have, nevertheless, neither the time nor the courage to face bulky text-books, the *Clinical Journal* offers very considerable attractions, and the careful reader of its pages will find that he keeps up his knowledge with very little conscious effort.

THE *Medical Magazine*, after a career of some years, during which it seemed to do little to justify its existence, has recently broken fresh ground, which, if cultivated with diligence and assiduity, will very likely prove of considerable value to the profession at large. This is the special feature introduced a few months ago of giving prominence to everything concerning medical defence and medical protection. The Magazine is now the official organ of the London and Counties Medical Protection Society, a body which, together with the Medical Defence Union, may be regarded as representing some of the most important interests, not only of individual members, but of those of the profession as a whole. So important are these interests that it is a great pity that the many attempts to unify the two societies representing them have so far been unsuccessful. In matters of this kind unity spells strength, and competition weakness. Looking at the membership of these two bodies one is immediately struck by the very small proportion which the combined members bear to the whole profession. There are a great number of medical men practising in all capacities who thus go about with their professional reputations and their savings in their hands, both of which could be secured to them by the small annual subscription required for membership of either of these bodies. It is very much to be hoped that no Fellow of the Society is so thriftless as to subject himself to the grave risks entailed by a want of recognition of these facts.

Treatment, the publication which appears monthly in a cover which has at least the merit of being distinctive, in addition to some good set articles, not infrequently contains some therapeutic "tips" of considerable value. Ninety-nine patients out of a hundred consult a doctor in order to obtain relief, and if that relief is not forthcoming in a reasonable time they are apt to take their troubles elsewhere. There are not many text-books which concern themselves with treatment in any considerable detail, and those that do err, as a rule, on the side of prolixity, confusing the seeker with the number of courses, or rather of prescriptions, open to him. The paper with the scarlet cover is very helpful in indicating which of all the new drugs which unceasingly flood the market are likely to prove of any value and in what conditions. A very good example of this kind of usefulness was presented in the October number, in which Dr. L. Freyberger, the editor, discoursed on the value of icthyol in various morbid conditions, and the best means of employing it to suit varying exigencies. The Periscope portion of the Journal, in which the various branches of medical knowledge are reviewed at stated intervals, is exceedingly valuable to those (and they constitute the great majority) whose time does not permit of their consulting long articles in the various publications, English, American, and Continental, which appear periodically. *Treatment* is certainly a well-conducted, useful, and time-saving journal.

THE *Polyclinic*, the organ of the London Post-Graduate College, has always been the subject of much controversy among those who are interested in the affairs of the College. There are, on the one hand, those who contend that the Journal is one of the mainstays of the institution, while on the other, are those who declare that it is a monstrously expensive toy, wholly devoid of practical value. The truth seems to us to lie, necessarily, neither with the one side nor the other. Conducted on its present lines it may possibly serve as an element of cohesion among the members, but there can be no doubt that this element is bought at a price far exceeding its

real value to the College. In one respect the paper is excellently managed ; the reports of the lectures and demonstrations are as good as they can be. They are, indeed, in not a few instances, very much better than the originals, the standard of which varies through all grades from the admirable to the contemptible. To judge by the reports in the *Polyclinic* we should believe that the standard was uniformly admirable—such is the value of a talented, an energetic and a hard-working reporter and sub-editor. The element in the paper which makes for that downfall which so many prophesy for it is the fact that it is the dumping ground for the fads of a few men. That some of them happen to be very distinguished does not alter the position. What readers may want it is not always easy to say, but it is quite safe to assert that they do not want, month after month, to be pelted with undigested views on recondite subjects vaguely supported and indifferently expressed.

THE Polyclinic, the institution that is, is excellent in principle. A place where qualified men may see cases, hear demonstrations and lectures, and keep themselves in touch with modern thought and modern methods is one whose usefulness must be apparent to all. Until the College in Chenies Street was organised, such a place was not to be found in London. The West London Hospital certainly has a school attached to it, against which no one could cavil, but it has two defects. It is not centrally situated, and the teachers are limited to those on the staff of the Hospital. A really useful post-graduate college should have a broader basis of instruction, and should have it in its power to attract and employ teachers from anywhere. It should also be so situated as to be readily accessible. These two conditions are fulfilled by the Polyclinic, and the number of medical men who have availed themselves of the opportunities it affords is a striking testimony to the need for such an institution. And yet there are whispers of grave financial difficulties ahead, which have received point, if not confirmation, from some recent resigna-

tions from the board of management. It would be a great disaster if an institution so excellent in principle and fulfilling a a want so long and so keenly felt should be sent to the wall either by bad management or by persistence in a policy of which representative men disapprove.

CONVERSAZIONE.

After the ordinary meeting on December 17, the President, Dr. Symes Thompson and Mrs. Symes Thompson, held a reception at 33, Cavendish Square, for which all the members of the Society received invitations for themselves and ladies.

A charming musical programme was arranged, in which several professional artistes took part.

Among the guests invited to meet the members were the Presidents of the Royal College of Physicians and Surgeons, and of the principal medical societies, the Duke and Duchess of Wellington, the Earl of Onslow, the Earl and Countess of Derby, Earl and Countess of Meath, and the Earl and Countess of Stamford, the Bishop of London, the Dean of Westminster, Sir William and Lady Broadbent, and several of the leading members of the medical profession.

The Climatological and Balneological Society mustered in large numbers from London and suburbs, and from the country. A most enjoyable evening was spent, and the guests appreciated to the fullest degree not only the entertainment which had been provided for them, but more especially the cordial and graceful hospitality of their host and hostess.

THE JOURNAL

OF

Balneology and Climatology.

VOL. VII. APRIL, 1903. NO. 2.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

WEDNESDAY, DECEMBER 17, 1902.

ON CONVALESCENCE AND CHRONIC ILLNESS.

BY DR. PERCY LEWIS (FOLKESTONE).

CONVALESCENCE and chronic illness have not recently received the attention which I think they deserve. In contemporary literature I can find very little relating to them. The Ancients, however, had very decided views. Plato in his immortal work "The Republic," declared there were to be no doctors in his "ideal state," for doctors were the evidence of a diseased state of society. "If a person became 1," he said, "let him get well, or else die and so get rid of his troubles. But let there be no tinkering with or bolstering up of the constitution."

If Plato were present this evening, he would be considerably surprised to hear how our practice and ideas now differ from the somewhat crude opinions which he held on these subjects.

Practising as most of us do in health resorts, we are all more or less specialists on these subjects, and considerable advantage I hope will accrue from our discussion of them. I have grouped the two together because, as I shall show,

they present many similar features both in pathology and treatment. It will be impossible of course in one evening to treat the matter exhaustively. This paper is therefore intended merely as an introduction to the discussion, in which I trust many will join and give their experiences.

Convalescence may be defined as that period of a disease intermediate between the cessation of the more prominent symptoms and full restoration to the previous state of health. It is therefore definitely a state of illness. It has its degrees and its course the same as disease. Miss Nightingale says of the nursing of convalescence, "Many cases would be irretrievably lost but for careful nursing, some would become permanent invalids, others burdens to themselves and their friends for the rest of their days. There may be a return to life; but return to health and usefulness depends upon the after nursing and treatment in almost all cases."

The symptoms of convalescence in general are those of lowered vitality, most marked in one or all of the nervous, circulatory, and digestive systems. The patients are incapable of sustained use of any organ, more especially of that most affected by the disease. A little mental work easily tires them, they are apt to be cross and irritable, they show great sensibility to changes in temperature, they suffer from dyspnœa on exertion, their digestive organs are easily upset, they are incapable of much muscular exertion, palpitation is easily excited, the urine frequently shows excess of phosphates or urates, the organism in fact easily gets out of gear; and the colour and expression of health are absent. The temperature is more unstable than in health, shows greater daily variations, and undergoes very considerable rises on provocations which in health would be powerless to affect it.

The causes of this lowered vitality may be included under some or all of the following heads:—

(1) Continued high temperature.
(2) Changes in the blood giving rise to altered nutrition.
(3) Changes in the circulation.
(4) Shock and loss of nervous control.

(5) Large losses of blood or of some of its constituents.

(6) Want of nourishment, mostly from disorders of the digestive organs.

In the 1,700 to 1,800 patients who pass through the St. Andrew's Home every year, I find that continued high temperature has been present in about one-fourth. The lowered vitality after fever is well known. We know that in fever every organ is affected, whatever the cause of the temperature. The cells of every organ and of the muscles also undergo structural changes which can be seen by the microscope. The increased excretion of nitrogenous matter by the kidneys proves an increased disintegration of the albumen of the body itself. The effect of fever on the nervous system is shown by the usual mental depression after it has gone, and by the frequency with which many forms of mental disease come on after acute illnesses. The granular and fatty changes known to take place in the cells of the digestive organs, cause the latter to fail in furnishing their normal digestive juices, as is seen by the dry mouth, loss of appetite, constipation, light motions, &c., so that very little digestion of food occurs.

The patient in fever is not only burnt away but starved. Hence another cause of lowered vitality—emaciation. The urinary pigment is much increased, showing that considerably larger numbers of blood corpuscles are being disintegrated; but most important of all is the effect of fever on the heart. It is made to beat more rapidly, consequently its wear and tear are more, it is fed less, it is flooded with more poisons, the result of tissue waste. No wonder the cause of death in many acute illnesses is cardiac failure. The marvel is that it does not happen more often. An organ so badly battered requires and seldom receives sufficient care in convalescence. Careful systematic examination of the hearts of a number of convalescents shows a very large proportion of dilated ones. The apex beat is found more or less displaced outwards. The impulse is slapping in character, the various valves are more or less leaky, and many hearts are found so nervous and palpitating under examination that a satisfactory examination is impossible.

Such hearts require the very greatest care in convalescence that they are not worked beyond their enfeebled powers. I have had personal experiences of this kind of enfeebled heart after influenza.

Beside the changes in the blood produced by altered metabolism, convalescents also suffer from diminished excretion. Not only are the excretory organs still feeling the effect of the high temperatures and still undergoing repair, but they are without the helpful stimulus of exercise. The muscles, too, having undergone the degeneration described first by Zenker, are unfitted for much exertion. Different diseases produce special changes in the blood, further serving to clog the machine, *e.g.*, gout, rheumatism, anæmia, &c. The general mechanism of the circulation has been upset by the altered conditions as to temperature, independent of any special heart affection. In cases of afebrile illness the circulation has suffered from the enforced rest. It is, so to speak, out of training. Patients convalescent from fractures are often as feeble as those who have undergone high temperatures. Their hearts and circulations and indeed all their organs have suffered from the enforced rest, and consequent deficient elimination. The feeble digestions, the diarrhœa or constipation following fevers are notorious, but very similar conditions obtain after various diseases connected with the digestive organs, and also from the prolonged rest entailed by surgical injuries and operations.

In the case of the latter there is often the loss of blood to be made up. A large hæmorrhage, whether it has a medical or surgical cause, takes a very long time to make good again. But even without much hæmorrhage I am sure that the shock of large surgical operations is frequently not fully appreciated by operating surgeons. They tell their patients that they will be quite well in two, three, or four weeks, as the case may be. In my experience, and it is a point to which I have devoted some attention, patients are hardly ever well, that is, in their previous state of health, in the time named. To quote Miss Nightingale again, "there may be a return to life," but this is not necessarily health. The wounds heal

rapidly indeed, but the patients are "not themselves." They have no energy, they cannot apply themselves to their previous occupations, they suffer from various slight ailments, as dyspepsia, neuralgia, sleeplessness, all pointing to want of tone in the nervous system.

When we remember that the shock of even slight operations may cause death on the table, and when we see a patient immediately after a severe operation, the fact of this shock is obvious. I do not wish to be understood as saying that large surgical operations always produce this condition. We are frequently surprised by the rapid recovery which patients who have undergone severe operations make. Still I have several times seen and also heard of patients being ill for weeks from the shock of a tooth extraction. Patients who have had concussion of the brain suffer in just the way I have described. The conditions are in fact the same. Similar results are occasionally seen after the passage of calculi or an attack of angina pectoris.

This condition of shock may last for weeks or months, but a good deal depends on its recognition by the attending practitioner, or it passes on to what is then termed "nervous debility," hysteria or neurasthenia, states of chronic illness.

Chronic illness may be simply a prolonged state of convalescence ending in return to health, or it may be a condition arising *de novo* and never reaching the dignity of an acute illness. Nevertheless the patient is in a very similar state to a convalescent. There may be fever, but independently of that, there is the same loss of exercise and consequent retention of waste products, the same sort of cardiac weakness obtains, and there is the same tendency of the system to react excessively, to slight adverse causes. The digestion is feeble and the muscles also, and the patients are just as much in need of medical assistance. Whatever the special features of the particular chronic illness, this state is common to all of them, and the recognition of this fact is of the first importance in treatment. Here a difficulty occurs, for the necessary rest which the illness entailed has helped to produce the

condition of retained waste products and muscular and cardiac feebleness. The muscular and cardiac feebleness have in turn contributed to produce loss of exercise and retention of waste products. Thus things work round in a vicious circle into which it becomes difficult to break. To put the matter in another way, the illness, whether chronic or acute, has produced a change of habits and environment. When a healthy active man is suddenly cut down with an acute febrile illness, this change of habit and environment is obvious. From taking plenty of out-door exercise and good meals of solid food, he changes to confinement to bed and liquid diet. His temperature from normal rapidly becomes febrile. His tissues, instead of being automatically repaired as wear and tear occur, now quickly undergo degenerative changes and become choked with waste products from the incessant combustion and defective elimination. Obvious as these changes are, and important as the knowledge of these conditions is for the successful treatment of the acute illness, they are less obvious, but the recognition of the altered circumstances is just as necessary for the efficient treatment of the convalescent or chronic states. The difference between the two latter lies chiefly in the fact that the convalescent from an acute illness has not had time to acquire so thoroughly that change from active to passive habits, which to the chronic invalid becomes a second nature. It is these acquired and passive habits which in very many instances form, much more than the disease, the real bar between illness and recovery to health. Our aim then is to get the convalescent to resume his ordinary habits of life with as much rapidity as is consistent with perfect safety. Some patients need no encouragement, but are always getting relapses from pushing on too quickly; others are so timid that there is the greatest difficulty in getting them to make the advances as we wish them. Both are in danger of becoming permanent invalids from opposite causes. In chronic illness our aim is the same, and the more we can get these patients to resume the habits of ordinary healthy people the easier it becomes for them to throw off their complaint.

A great physician once said that "the days of a convalescent should be very much, but not exactly alike," meaning that there should be only a little advance, but still an advance each day in returning to the habits of health. Now it is in bringing about this return to normal habits that change of air produces much of its good results. The treatment of almost any chronic deviation from health may be assisted by judicious change of air. The patient gets away from most of the environment of his illness. He sees new scenes, new people, gets new interests, and in fact receives a great stimulus to his whole system which experience of generations has shown to be of the greatest benefit. But the stimulus *is* great and the patient must be controlled and directed that he be not stimulated to act beyond his powers.

After a short acute illness, there is generally no difficulty in getting patients to resume their normal habits, but after a long one, or with a chronic illness, the task is greater because the damage done is so much more and the habits of illness have become more confirmed.

The problem is lessened and made easier by any method of treatment which can produce on the patient while still in bed, the beneficial effects of exercise, but in a lesser degree. All who have read Dr. Harry Campbell's fascinating book on "Respiratory Exercises," will know that we have in these exercises such a means of treatment. They really amount to exercise in a mild dose, that is to say, all the remedial effects of exercise may be obtained by the patient with very little fatigue. For some years I have been in the habit of using somewhat similar exercises which I collected from various sources. These, with some original ones form a chapter in my work on "Spinal Curvature," and are printed in a separate form under the title of "A Manual of Medical Exercises." But whichever are chosen for use in a particular case the effects produced on the condition of the patient will be found, in the magnitude of the results obtained, to equal in degree those so often seen in children from the removal of adenoids. These results, to my mind, form two of the medical miracles

of the day. Far less tiring than massage, capable of being carried out by any intelligent nurse, this treatment is able in a very short time rapidly to strengthen a patient whose powers may for weeks have shown no sign of improvement or response to the medical care lavished on him. We have all had cases when it seemed impossible to get beyond a certain point, without there being any reason for it except want of power. For such cases I would recommend a trial of these exercises. It is possible that the stimulus of change of air acts in somewhat the same manner by increasing the rapidity and extent of the respiration. For the exact way in which the improved respiration acts on the general health, I would refer those interested to Dr. Campbell's book.

From what has been stated as to the causes of loss of tone it is obvious that the treatment of convalescence consists in a great deal more than sending a patient to the seaside and the prescribing of a tonic.

Unfortunately our patients and, I fear, in many cases the doctors who send convalescents to us, are not sufficiently imbued with the necessity for the medical supervision of this important state. It is very common in my experience to be consulted by convalescents after they have been a few weeks at the sea, for indispositions which should have been avoided if they had been under medical care from the time of their arrival. Patients should not take the sea air cure without local medical advice, any more than they should go to Harrogate or Homburg to take the waters without consulting the local specialist. We know that the results are often as disastrous in the former as in the latter case, and we should all do our best to impress on our medical friends that their responsibility to their patient is not sufficiently discharged by a general direction to "go to the seaside." A person ill enough to be sent away is not often well enough to look after himself. I have often heard patients say, "I went to such and such a place and it did me no good." On enquiry I nearly always learn that they did not consult a local doctor.

With regard to the seaside most will agree that there are

very few conditions in which the seaside is not the best place to go to, at any rate at first. The remedial effects of sea air in enlarged glands and in other tubercular affections are of course notorious, but equally good results are to be obtained in a number of other chronic affections, such as chronic uterine complaints, anæmia, phlebitis, &c. In nearly all our seaside health resorts as well as many inland ones, all the modern aids to the treatment of disease, such as medicated baths, electricity, massage, &c., can now be obtained. We must remember the weakened condition of the patient and the increased liability of the different organs to disease from over-fatigue, such as travelling a long distance would cause. It is well therefore to begin with change to a seaside place within easy reach, and if necessary to proceed later on to more distant localities. The number of inland bracing places, suitable for convalescents and chronic invalids in this country is so limited, to name Buxton, Harrogate, Ilkley, Malvern, Tunbridge Wells, Hind Head, Llandrindod and Strathpeffer is practically to mention all. But one often hears from patients and also from doctors that the seaside is bad for certain conditions, though all who hold this opinion do not agree, and indeed are often opposed to each other.

Complaints most often credited with being made worse by the sea air are, rheumatism, skin diseases, especially eczema, throat complaints, renal disease and asthma. Now as regards rheumatism, I noted when working at St. Andrew's Convalescent Home for six years continuously that only twice did I have to send away rheumatic patients because they became worse at Folkestone. As a large proportion of the 1,700 patients admitted yearly are rheumatic persons or convalescents from acute rheumatism, this fact seems to point the other way. We also find no difficulty in getting our rheumatic patients at the Victoria Hospital well, nor have I found much with my private cases.

Skin diseases occur in persons resident at the seaside, but not in my experience in sufficient numbers to credit it with undue influence. A short time ago I was called to see a

gentleman who had been suffering for three months with universal acute eczema. His doctor in London told him he would never get well there, and he should leave London at once, but did not tell him where to go. When he had taken rooms at Folkestone, his doctor told him it was the worst place in the world to go to, and he would never get well here either. Nevertheless he was well in three weeks.

My experience is certainly not that throat cases do badly, except those who are incapable of nasal respiration. Dr. Ralfe, in his book on kidney diseases, mentions Folkestone and other south-coast health resorts as suitable for cases of chronic Bright's disease.

Many asthma cases undoubtedly suffer from acute attacks whenever they come to the sea, but they also get similarly affected at some inland places. Folkestone residents get cured of asthma as quickly as persons in other places; personally, I am not often called upon to attend persons suffering from this complaint. There is one point about sea air to which attention has only recently been directed and that is the influence of sea air in determining the onset of convalescence.

Recently the son of a medical friend of mine in London had been suffering from acute pyrexia induced by a pleuro-pneumonic attack for six weeks, with no sign of approaching convalescence. He sent him straight from bed to Folkestone by ambulance carriage only two days after his chest had been aspirated thirty ounces. On the evening of his arrival his temperature was 103° as usual. At the end of a week his temperature, which had shown a daily drop, was normal all the twenty-four hours and remained so. Convalescence was in fact established. In another case a lady suffering from pyrexia for weeks in London from a chronic renal abscess, rapidly lost her pyrexia on removal from London into the country. Similar results on temperature are of every day occurrence in cases of phthisis. In the case of town-dwellers the influence of sunlight and the inhalation of a pure air free from microbes must be beneficial factors.

Sea air is credited with having certain deleterious effects on convalescents and others, the chief of which are constipation, biliousness, headache and sleeplessness. All this may be summed up in the word "liver." In this case I believe it is the individual and not the place that is to blame. They must adapt themselves to their altered surroundings. Most of them come from London, or from inland relaxing climates. The characteristic of many seaside places is their dryness and bracing properties. These properties entail more evaporation from the skin and breath, more flow from the kidneys, increased and consequent retention of waste products. The fæces become drier and harder and are not therefore so easily expelled. Losing more fluid these patients should drink more water in some form. The surface too requires to be kept warmer. They should therefore wrap up more. Thus they will get the greatest good from the air without any drawbacks. Especially does this hold good for convalescents from chest diseases, rheumatism and gastro-intestinal complaints.

Convalescents coming to the seaside have often a great idea of having cold sea-water baths either at home or in the baths or sea. They think that it must be very beneficial to them. We know that a cold bath produces depression, followed if not too prolonged, in healthy people by reaction. From what has been said previously of the effect of disease on the heart and circulation, it is obvious that cold baths will be unsuitable for convalescents for a considerable period after apparent return to health. A fatal chill might easily be taken, or cardiac failure or dilatation occur. Except in very fine and calm weather sea bathing should only be taken by the very strong. It is a common occurrence for people coming to the sea after hard work or anxiety without perhaps having had any special illness, to knock themselves up by sea bathing, though frequently this is due to staying in the water too long. If a patient is determined to go in for sea bathing he should commence with a salt water bath in his room for the first three days, then on alternate days a short swim in the baths, and finally in the sea. But in my opinion a patient

who can take sea baths without suffering fatigue or impairment of appetite does not require a doctor.

We are often consulted as to where a convalescent shall stay at the seaside, whether in rooms or in a hotel, and we are asked to recommend. Now there are points for and against hotels. The points in favour are the relief of monotony, the fact that amusement is provided in the evening and that the cooking is good. Against, are the facts that they are many of them noisy, and that the fare provided is unsuitable for convalescents. I think our local medical societies could do a great deal by approaching the various managers with regard to these points. Apartments differ very much both in price and cooking. Here again the local societies would grant a boon to the public by keeping a registered list of those they could recommend. The fact of such an official list, with the possible penalty of being taken off it, would, I feel sure, be followed by improvement in the cooking and in other ways. Such a list might be arranged in classes according to their general excellence in cooking, cleanliness, civility, &c.

Patients usually expect to take medicine when they consult us, and certain drugs are of the greatest benefit to convalescents. They must, however, fulfil one condition, viz., that they must not upset the appetite or interfere with digestion. From my previous remarks one will not be surprised to hear that I attach importance to the prescribing of heart tonics. Strophanthus, digitalis and strychnia are of the greatest benefit and do not interfere in any way with digestion. The effect must of course be watched. Another drug is frequently of service in tardy convalescence, viz., valerianate of zinc. This is especially useful where the nervous system seems to be the weakest point, and even in many cases where this is not apparently so. Cases where patients continue to feel weak without one being able to exactly say why, are frequently greatly benefited by valerian or by valerianate of zinc. In my own town this drug has a great reputation being known as Dr. So-and-So's nerve pills. In this form it had been largely prescribed by a physician who once practised there.

For the successful management of convalescence, routine and regularity are necessary. The whole day should be mapped out for them into times of rest and exercise. The hours of meals, medicines and refreshments should be stated, also the meals themselves should be supervised as to quality and amount, and the question of alcohol decided. In doing this I would dissuade you from giving patients printed forms. This is the custom at many inland health resorts and one which defeats its own object. The patient shows it to a friend who perhaps has also received one. They then think it is a routine business and pay no attention to it. The food should be taken in frequent small meals in which albuminous matter takes a larger proportion than normally. This must of course be in an easily digestible form. One should avoid filling the convalescent's stomach with large masses of food of low nutritive value. There are many means to the end indicated which will necessarily vary with the case to be treated.

One of the greatest aids we can have in treating a convalescent is that *rara avis*, a good nurse. Nurses unfortunately so often lose their interest in a case when it has become convalescent. To keep them up to the mark it is best to get them to continue filling up their report papers daily, and to read them over carefully at each visit. Nurses are specially useful when a patient first begins to take exercise, as they, being present, are able at once to check any tendency to over-exertion, and to see that the rule "that the patient should put on extra covering temporarily, whenever sweating is induced," is carried out.

The essence of the treatment of convalescence and chronic invalidism is to bear in mind the manner in which convalescents and chronic invalids differ from healthy persons, and to endeavour to remedy these defects without adding to their difficulties. Progress must be slow at first, the heart and nervous system must be gradually strengthened, food and exercise must be arranged so as to aid in rebuilding the constitution without putting unnecessary additional work on the

excretory organs. I have mentioned the use of graduated medical exercises and the indications for such drug treatment as is commonly necessary, but the benefit of all these is much enhanced if used in combination with a change of climate. For reasons which I have endeavoured to point out, removal of the patient to the nearest of our seaside health resorts where he will be stimulated by breathing abundance of pure aseptic air, and by being subjected to the influence of the chemical action of light, is after all the most important factor.

DISCUSSION.

The PRESIDENT (Dr. Symes Thompson) said: Whilst cordially accepting the conclusions arrived at by Dr. Percy Lewis regarding the value of calming and soothing surroundings in the early stage of convalescence before the tissues damaged by recent disease have had time for renewal, it must yet be admitted that in the second stage of convalescence, when the patient is to be adjusted to meet the pressure of daily life, a bracing and invigorating environment is called for. We all recognise that in degenerative conditions Egypt and Algiers rather than Davos or St. Moritz are the desiderata. So in convalescence, whilst in the early stage, a soft southern clime, *e.g.*, Ventnor, Torquay, or Falmouth may be suitable, in the second stage of convalescence Margate, Llandrindod, Buxton, or Harrogate may be better fitted to secure complete recovery.

Dr. LEON was thoroughly in accord with the remarks of Dr. Percy Lewis. In the treatment of convalescence the most important point to take into consideration was the disease from which the patient was recovering. After certain diseases it was useful to increase and promote metabolism by a stimulating and bracing climate, *e.g.*, after certain operations, traumatisms. After other diseases it was important to reduce metabolism as much as possible and also to promote skin excretion. In these cases a mild relaxing climate was most suitable, *e.g.*, in renal cases, many cases of neurasthenia and heart disease. The time of year was also an important con-

sideration in choosing a place for convalescence. The Yorkshire moors, or those of Scotland or Dartmoor would not be places to choose in winter, though they might be ideal in summer.

Dr. T. F. Gardner remarked that Bournemouth presented three varying climates for the benefit of the convalescent; the still, quiet relaxing air of the valley, the somewhat more bracing climate of the east and west cliffs, yet sheltered by trees, and the yet more bracing air of the coast towards the east in the direction of Southbourne and Christchurch. He had noted the tendency to bilious derangement but it soon passed off, and in a few days the patient became acclimatised. He laid stress on the value of respiratory exercises as a means of securing a better oxygenation of the blood and so a better combustion of those waste products mentioned by the reader of the paper. He emphasised the necessity of telling convalescents that while they were well enough to leave home and so passed from the care of their own medical attendant, it would hasten their recovery to place themselves in the hands of a medical man who could assist their convalescence by a judicious supervision of this part of their illness.

Dr. W. V. Snow said: I am so cordially in agreement with the able and exhaustive paper of Dr. Percy Lewis, that I will touch on one point only. Marked improvement can always be obtained by "the rest" treatment, and generous diet in convalescence from acute diseases, the rest, however, should as far as possible be followed by graduated exercise. The present fashion of so-called "forced feeding" is much to be deprecated. Nature always resents a violation of her laws, and the patient too often returns to his doctor fat, flabby and weak, and many weeks of treatment are required to restore the impaired digestion.

Dr. Charles Begg (Bath) said: I have listened with the greatest pleasure to Dr. Lewis' paper. I anticipated a most interesting and instructive debate to-night, but as Dr. Snow remarked, Dr. Lewis seems to have exhausted

the subject and must take the reluctance to speak as a compliment. To my mind the treatment of convalescence is as important, if not more so, as the treatment of disease, and it is to be deeply regretted that the subject is absolutely ignored by the schools. We are trained to diagnose disease and treat it, but convalescence is left to take its chance. How many cases of chronic ill-health can be traced to mistaken treatment during convalescence? I regard the average convalescent as a person who, to use a banking simile, has exhausted his credit balance, and Nature does not allow him an overdraft. It is our duty to see that he is placed in favourable circumstances to enable him to rebuild up that balance. Here we touch on the question of the climate suitable for the universally ordered change. Roughly speaking, we may divide climates into two, the bracing and the so-called relaxing. I think sedative is the better word, because it conveys a definite meaning. Much has yet to be written on this subject, and I believe that often great harm is done to patients at the stage we are considering by sending them to the bracing, stimulating climate, instead of—at least at first—to the sedative one. Like the use of stimulants in treating disease, they must be used with caution, and are only indicated when we have a reserve fund of strength on which to call. I can recall many instances of patients sent to bracing climates, altitude or sea air, where the first effect was excellent, but it was quickly followed by the collapse of exhaustion. I would say a good word for Bath as a sheltered sedative climate, and in my experience can point to its great value in the treatment of convalescents. Dr. Lewis claims sea air to be a panacea; says that if they are not ripe for it when they come, it will of itself soon make them so. I know no panacea. Cases must be picked. Certain patients do not do well with sea air, and my experience leads me to think practitioners will be wise if they think first of the claims of the sedative climate for their convalescents and second of the bracing one, making it what is known in Spa work as the after-cure. Our whole treatment of disease may be summed up in placing our patient

in the most favourable circumstances, and Nature works the cure. This is perhaps of greater importance in convalescence. I plead guilty to not having known of Dr. Campbell's work, but can endorse most strongly all that has been said as to the value of respiratory exercises in convalescence and regard the proper oxygenation of the blood as the starting point of progress.

Dr. HARRY CAMPBELL argued that much of the weakness which the convalescent feels upon first getting up is due to the undue accumulation of blood in the splanchnic area, owing to disuse of the compensatory mechanism which counteracts the effects of gravity upon the circulation in the upright position. A question not always easy to decide was how soon after the convalescent gets up should he be sent away.

Dr. LEWIS, in reply, said that he did not attach much importance to the subnormal temperatures of convalescence. They were expressive of feeble metabolism necessitating removal to a bracing climate and possibly an indication for alcohol. In answer to how soon should a patient be moved after an acute illness, he considered as soon as possible, that is, as soon as the patient could stand the journey, and he referred again to the influence of sea air in determining the onset of convalescence when that was delayed. In reply to the suggestion that relaxing climates might be good for convalescents, this could only be right when the patient's illness occurred at a bracing place. In convalescence the metabolic activity of the body is subnormal, to bring it to the normal it must be stimulated by bracing climates, not depressed by a relaxing one. Relaxing climates might be of use in cases of chronic renal disease or after meningitis or mania.

Dr. Lewis entirely agreed with Dr. Snow in his opinion of sanatoria, but suggested that possibly many of them did not carry out the treatment as originally devised at Nordrach. Paddling was certainly unsuitable for convalescent children, and even in healthy ones occasionally produced alarming symptoms. Different diseases leave convalescence having different requirements, but it was only general principles which were being dealt with that evening.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

WEDNESDAY, JANUARY 28.

ON THE LOCAL FACTORS INFLUENCING CLIMATE, WITH ESPECIAL REFERENCE TO SUBSOIL.

BY CHARLES W. BUCKLEY, M.D.LOND. (BUXTON).

THE climate of Great Britain shows probably greater variety in proportion to the area of the country than that of any other region. We have marine climates of almost every variety which are well known and patronised, we have also inland climates of many kinds which are, however, but little known, and it is with these I shall chiefly deal.

The chief conditions influencing our climate are :—

(1) Latitude and, to a less extent, longitude.

(2) Position—inland or marine.

(3) Geological formation, which embraces subsoil and nature of country.

(4) Altitude and relation of surrounding hills.

The two latter are those with which I wish to deal. Marine climates owe their differences almost entirely to their aspect and to the winds from which they are sheltered, or to which they are exposed; but the conditions governing inland climates are much more complex.

The geological formation of England is like the climate, presenting more varieties than perhaps any other region of equal extent. The distribution of the chief formations is shown in geological maps, but the number of stations from which full meteorological records are available is not sufficient to justify drawing strict conclusions upon each separate variety, and I therefore have grouped together those which show similar characteristics in order of age, and it will be seen that the older, from the igneous to the millstone grit,

form the more mountainous districts, while the more recent form the plains and river estuaries.

(1) The Igneous Rocks and the Precambrian, Cambrian and Silurian.

(2) The old Red Sandstone.

(3) The Carboniferous or Mountain Limestone.

(4) The Millstone Grit and Coal Measures.

(5) The Red Marls and Magnesian Limestone—the Permian Rocks.

(6) The Triassic, including Bunter and Keuper.

(7) The Jurassic, including the Oolites and Lias.

(8) The Cretaceous and the Wealden Clay.

(9) The Tertiary or Eocene beds.

(10) The Alluvium.

The geological formation is the safest guide to the character of the soil and subsoil of a district in the absence of the necessary local knowledge, although the typical strata may be very deep below the surface; for, as Ramsey has pointed out, "The character of the soil is directly and powerfully influenced by that of the rock masses lying below, but the abrading agencies of the glacial period have done a great deal towards commingling the detritus of the different geological formations, producing wide-spread drift soils of varied composition" ("Physical Geography and Geology of Great Britain").

I shall attempt to show that humidity varies with different formations and soils; but first it is well to get a clear idea of what humidity really is. Relative humidity, that is, the proportion which the amount of vapour present at a given temperature bears to the amount necessary for saturation, is the form in which humidity generally appears in meteorological reports. From a medical point of view, however, absolute humidity appears to be the more important, for Sir Herman Weber says: "The degree of absolute humidity is of particular importance in regard to the effect of moisture on the lungs. Since air there takes up moisture to the extent of saturation at the temperature of the body, and this moisture-laden air is then expired, it is evident that its capacity for

moisture, that is, its dryness, depends entirely upon the absolute weight of moisture in the inspired air, whatever its temperature" (Von Ziemssen's "Therapeutics," section on Climate).

If the inspired air contains 3 grains of aqueous vapour per cubic foot at 50° F., it has a capacity for an additional 15·7 grains at 98°, and its relative humidity is 74 per cent. If air is inspired at 42° F. with the same amount of moisture, namely, 3 grains, it has still the same capacity, but its relative humidity is now 98 per cent. It is therefore obvious that the question of humidity from the point of view of pulmonary effect must be one of absolute humidity. The method I have adopted to express this humidity is taken from the above source in dealing with the climate of Davos, for which Sir Herman Weber is responsible, and which seems the logical outcome of what I have just quoted. The amount of vapour present is indicated as a percentage of the amount required to saturate air at 98·4; it is much simpler than giving it in terms of vapour tension.

In addition to its pulmonary effect, humidity must be considered in relation to its influence on the skin, and here relative humidity is of more importance, since the moisture evaporating from the skin depends on the degree of saturation at the temperature of the air, amongst other factors such as movement, and with greater evaporation there is greater loss of heat. On the other hand, if the air is moist it is a better conductor, and hence, though loss of heat by evaporation is diminished, loss by conduction is increased, and this loss is not so readily prevented by clothing as that from evaporation, which accounts for damp weather often feeling colder than dry even of lower temperature.

The degree of absolute humidity varies with season and time of day and is generally, but not always, higher with higher temperature and *vice versâ*. Variations of relative humidity follow to some extent an opposite course, it is in general lower in summer than in winter, lowest in early afternoon and highest at sunrise. It is unfortunate that in this

country the observations are taken at 9 a.m. and 9 p.m. only, and chiefly the former—by no means the best times if we are to use them for estimating therapeutic values. Since evaporation from the soil is an important factor in humidity, and evaporation is at its greatest soon after mid-day, this being also the time when invalids are most out of doors, the degree of humidity at this time is the most important, and in a soil offering much moisture for evaporation the increase in the amount of aqueous vapour in the air will be much greater than with a dry soil, and also in the former case if the temperature rises higher than in the latter the relative humidity will be misleading, and thus damp soils take an unfairly high position in tables of readings at 9 a.m. At Davos and other Continental health resorts the authorities are aware of this and their readings are either mid-day, or the mean of morning, noon and night. There is a curious fallacy in certain statistics of Davos due to Volland, who notes that the air of rooms in Alpine resorts is drier than that in the open, instancing a reading of 87 per cent. out of doors at 37° F., while in a room at 55° F. the reading was 57·6. But investigation of these figures shows that the amount of aqueous vapour present in the first case was 2·26 grains per cubic foot, and in the second 2·82 grains, and therefore the outer air was the drier of the two. I regret I cannot show figures from Davos in comparison with those of English climates, owing to the different time of reading, but in the isolated instances I have seen the relative humidity is not lower than that of places in England. The absolute humidity is, however, much less—another point in favour of this factor as a basis for our conclusions on the subject.

I have sought in vain for any relation between the variations of relative humidity at different stations, in which respect my experience has been the same as that of Mr. Bayard (" English Climatology," 1891-1900). I think this is accounted for by the fact that relative humidity depends on two variable factors, namely, absolute humidity and temperature, so that absolute humidity is again shown to be the best for basing any conclusions upon.

Humidity has an important bearing upon diathermancy; a high degree of diathermancy being due to a low amount of vapour, that is, to a low absolute humidity, the sun's rays penetrating much more readily through dry air; hence the high diathermancy of the Alpine climates. The importance of this is well known, and emphasises what I have already said as to the greater importance of the question of absolute humidity in the climate of any health resort. This has also an important bearing upon the daily range of temperature. The layer of vapour near the earth is much less diathermic to heat rays reflected from the earth; the greater the amount of vapour the less heat reaches the earth, hence lower maxima, and since this is radiated less rapidly the minima are higher and thus the range is less. In a dry climate the earth receives more heat, but radiates it more rapidly, hence greater daily range. This may account for moist climates being "close" and oppressive, the dark heat rays radiated from the earth being detained by the moist air, while in dry climates they escape more rapidly and the heat is due in much greater proportion to the direct rays from the sun. Altitudes have a decided effect in modifying the maxima and minima, and thus act as equalisers by decreasing the range.

Although we have no great altitudes in this country, the value of those we have is greater perhaps than is commonly realised, for owing to our insular position and to other factors with which I have not time to deal, an elevation of 1,000 feet in England is equal in the quality of its air and many other features to one of three thousand feet on the Continent, or to five or six thousand feet in the Himalayas.

Since altitude decreases barometric pressure one inch for every 1,000 feet, the increased rarefaction of air will cause increased rarefaction of aqueous vapour, and thus a less amount of moisture to the cubic foot, otherwise it has not in itself much influence upon humidity.

In considering the effect of geological formation upon humidity, one must not forget that beyond the nature of the subsoil there is another factor, namely, nature of surface,

whether hilly or flat. Hilly districts have the advantage of good natural drainage; but even then the subsoil makes much difference, for bogland is by no means unknown even on the top of hills. Artificial drainage will also do much to modify the character of a soil, but it by no means follows that by such means a bad subsoil can be made a perfect one. An important effect of drainage, whether natural or artificial, is to render the soil warmer, since heat penetrates undrained land less quickly, and the temperature of arable land has been raised many degrees by drainage. On account of this question of drainage, an inherently damp soil, such as clay, may be, if in a favourable position for drainage, healthier and drier than a generally dry soil such as sand, if it is enclosed in an impermeable, and undrained basin, as Dr. Clippingdale has recently pointed out in the case of London. Therefore the value of a surface soil is dependent on its depth and on the subsoil, which may prevent the escape of moisture by its impermeability, or facilitate it either by the slope of the impermeable strata to an outfall or by fissures in those strata.

Hence nature of surface, whether conducive or not to natural drainage, is the first factor.

In Table I. I have arranged a series of inland stations from which I have records for ten years, or in some cases twenty, obtained almost entirely from the statistics of the Royal Meteorological Society ("English Climatology," 1881-1891 and 1891-1901, F. C. Bayard), in groups according to the formation on which they are situated, and have then taken the mean absolute humidity of each group and arranged the groups in order from the lowest humidity to the highest. The degree of difference may seem but slight, being reckoned per cubic foot of air, but when we consider the great amount which is taken into the lungs even in a short space of time, the smallest difference becomes of importance. The table does not take into account other factors, such as nearness to the west coast, entailing a preponderance of humid winds besides those peculiarities which are purely local and only to be understood by those personally acquainted with each district.

Amount of rainfall does not require consideration in this connection, as I shall shortly show. Some of the characteristics of the typical strata may be briefly mentioned. Granite, a type of the Igneous rocks, is practically impermeable to moisture, absorbing according to Parkes only ·025 per cent., and the same authority gives for the permeable formations, sandstone 4·9 per cent. and sand 9·9 per cent. Some rough experiments I have made myself, give for carboniferous limestone of the pure variety found in Buxton ½ to 2 per cent.; the impure limestones of the Lias and the Oolites absorb much more, but they do not belong to the mountain limestone formation. Millstone grit I found absorbed about 4½ per cent. of moisture, thus resembling the sandstone in absorptive power. Chalk, as far as I can ascertain, will absorb 18 to 20 per cent. Professor James Elliot has stated as a result of his experiments that dry clay can absorb its own weight of moisture, dry garden mould more than half its own weight, and dry sand little more than a third of its weight.

According to the amount of water retained by the soil so will be the degree of evaporation, and it is in this way that the soil or subsoil affects the humidity of the district. Another point is the question as to whether the water can accumulate to form pools or lakes, as in Cumberland and Wales and in some parts of the clay districts. The quality of the soil overlying the rocky strata is also important and will be dealt with as far as my knowledge and time will permit.

From the table it will be seen that the carboniferous or mountain limestone stands first as the driest formation; it is rarely covered with soil to any depth and is often bare. The vegetation is chiefly short grass, from the soil being so scanty and non-retentive of moisture, and in the districts north and west of Settle in Yorkshire the high plateaux are for miles half bare of vegetation. The chief mountain limestone districts are the Peak of Derbyshire, the northern and north-western parts of Yorkshire and Lancashire, and parts of Durham and Northumberland. I have only records from three stations, one from the Peak, one from Yorkshire, and one from Northum-

berland, but they are almost uniform. There is a peculiarity in the air of these limestone districts, a freshness and exhilarating effect which it is not easy to account for altogether, but to which the human organism is very sensitive. The large amount of ozone has some bearing on it, but I could not obtain sufficient records for comparison, and the low humidity of the formation is probably more important. It is due to several factors, the shallowness of the soil prevents accumulation of subsoil water, which rapidly drains away owing to the extremely hilly nature of the surface and the frequency of fissures in the rock leading to outfalls.

Moisture has a peculiar chemical action upon this variety of limestone, the carbonate of lime under the influence of carbon dioxide and water becomes converted into the bicarbonate, which is to some extent soluble. This may be carried away by drainage, or in situations where the action of water is more or less continuous with constant evaporation, the bicarbonate is redeposited and forms the curious stalagmites found in the caverns of the Peak. If this limestone is used in road-making the loose stones become cemented together by this peculiar action, and a hard, impenetrable surface is formed, and thus rain runs off as from asphalte, and although the dust may form a thin layer of mud this dries very rapidly. This action of water has a decided effect upon the humidity, for stagnant water is almost unknown and ponds and lakes, except artificial ones, are conspicuous by their absence, while springs are by no means so common compared with such formations as the millstone grit. A most important point also is that owing to the purity of the limestone the action of water does not leave behind an insoluble portion forming mud or clay, as in the chalk in some places and the granite. These characteristics led to the popular belief in the dryness of the limestone apart from any meteorological evidence, and its therapeutic value is obvious. In brief, the formation shows perfect drainage, hence low absolute humidity, absence of ground mists, high diathermancy and warmth of soil.

The coal measures occupy the next place in the table, but

are not of importance, since few would choose the coalfields as a place of residence apart from necessity. The strata generally consist of sandstone, shale, coal and ironstone, and are in relation with the carboniferous limestone and the grit on the one hand and the Permian rocks on the other. The districts are commonly somewhat hilly, and surface and subsoil drainage is good, hence the low humidity, and there is not usually any great luxuriance of vegetation, which generally tends to raise the humidity.

Next come the Permian rocks, including the red marl and magnesian limestone. They do not form any great part of England, and are not of much importance. The magnesian limestone is hard and not much acted on by water, so it might be grouped with the carboniferous limestone; the red marl is sandy, and both thus tend to low humidity. They are, however, overlain in many parts by conglomerate and boulder clay, which modify their characteristics. The surface is hilly, and thus drainage is good.

The next group includes the Igneous, Cambrian, Precambrian and Silurian strata, consisting of granite, laminated schists, gneiss and many other rocks. They are more impermeable than the limestone and of equally hilly surface, but are frequently covered by glacier drift and clay, the result of atmospheric action. Water acting on granite dissolves the silicates of potash and soda, leaving the allumina which forms a fine clay which may modify the humidity. These formations are chiefly found in the Lake district, Wales, Devon and Cornwall, and hence are all influenced by the humid South-west winds; all are regions of very high rainfall, the highest in England, but it is curious that the station with the lowest humidity has the highest rainfall of the four, viz., Seathwaite. The chief lakes are also found in these districts, and with all these factors making for humidity, it is remarkable that the formation stands so high in the table, and it points strongly to the influence of the subsoil as the most important factor.

We now come to the Triassic strata, including the new red

sandstone or Bunter and the Keuper. Both are soft and easily decomposed and lie under beds of detritus of great depth, chiefly sand and gravel in the Bunter and clay in the Keuper. They are found mainly in the West Midlands, the surface is undulating, the soil porous but well drained. Their humidity is therefore low and they embrace the best and most typical sandy soils. Macclesfield, for instance, on the Bunter has a soil of gravel drift of great depth lying upon the new red sandstone and its humidity is only 16·2 per cent.

The next formation is the millstone grit, a carboniferous sandstone porous to some extent and forming chiefly mountainous districts and high moorlands, hence good drainage. It is in many places covered by peat-bogs, and moorland tarns are not uncommon, thus it is not a dry formation in itself and springs are exceedingly frequent. The air is remarkably bracing on the moorlands of this formation, which is due, I think, chiefly to their altitude and in part to the large amount of ozone commonly present. As I have records from only two stations no definite conclusions can be drawn, and the relation between this and the old red sandstone should I think, be closer owing to the strong resemblances between them. The low position of this latter formation is probably due to its distribution predominating in those districts—South Wales, Devon and Cornwall—where humid winds are prevalent; but it should be noticed that of the four Devonian stations, all of which are under the same general climatic influence, Princetown on the granite has the lowest humidity, Cullompton on the new red sandstone and Castle Hill on the grit occupy an intermediate position with an equal degree, while Ashburton on the old red sandstone has the highest humidity, thus according with the relative positions of their formations in the table.

A most important formation ranks immediately below the grit and the Trias, namely, the Cretaceous, which covers a considerable area. It is difficult in spite of the number of stations to draw definite conclusions as to its humidity, owing to the great variety of the soils which cover the chalk beds,

and which are often of great depth. In Wiltshire, Berkshire and Hertfordshire, and on the north and south of London it is in many places covered by a deep layer of clay, which is a residue left by the dissolving of the calcium carbonate of the chalk, and which forms a stiff, cold soil. This is very different from the effect of water on the carboniferous limestone which chemically resembles the chalk. In East Herts and Suffolk the chalk is entirely buried under deep accumulations of glacial drift. Hence it is obvious that only where the chalk is near the surface or where the overlying strata are of sand or gravel can the soil be a dry one, and favourable to a low degree of humidity, as on the downs, where the driest station on this formation is situated. The surface is in many cases flat and low lying, which also tends to high humidity. I have included in this group Tunbridge Wells on the Wealden clay, which closely resembles the chalk, but the height of the town makes it less humid than might otherwise be the case. It would be most useful if someone well acquainted with the local variations in this formation would deal with it in detail.

The next group is that of the Jurassic strata, Lias and Oolites. These beds lie generally deep under accumulations of detritus of varied composition, but chiefly clayey. The Lias is a blue clay interspersed with beds of limestone and is very stiff and retentive of moisture the Oolites include strata of limestone, calcareous sand and masses of clay much covered with Boulder clay, and including the beds of Oxford and Kimmeridge clay. The formation as a whole is damp, but from the admixture with flints and beds of limestone is not so damp as the Eocene or Tertiary, which ranks next. This is essentially a clay formation, but overlaid with much detritus of varying kinds, as is well seen in the west and south of London. In this district much of the dampness is overcome by the extensive and thorough drainage and the great extent of impermeable pavement, but a counterbalancing factor is the Thames. Dr. Ewart, in vol. ii. of "Climates and Baths," has dealt so thoroughly with this district that further remarks of mine would be out of place. Of the other districts on this forma-

tion, the Essex marshes are known to be damp, other parts of East Anglia are covered by a tenacious soil, and the New Forest section has a wet soil of sand and gravel (Ramsey).

Having only the records of one station on the Alluvium I cannot include this formation, which is unfortunate, as it includes much of Yorkshire, including York and Harrogate, and also of the Fens and Romney Marsh. Most of these districts are very damp and low-lying, with soils of clay or gravel. Harrogate, although on clay, being an exception and standing fairly high.

I should like at this point to call attention to the dearth of full and reliable meteorological statistics from the inland health resorts. Taking the records of the Royal Meteorological Society and the Meteorological Council for a period of ten years, I find only three inland resorts of importance represented, namely, Buxton, Cheltenham and Malvern. It is most desirable that reliable statistics should be obtainable from every place claiming special advantages for the invalid, and the only stamp of reliability is their acceptance by one of the two above-named authorities.

Humidity is to some extent in relation with aspect and relation of surrounding hills. The aspect will have an important bearing upon the amount of sunshine and an indirect elation to humidity; for, as I have already mentioned, diathermancy depends on absolute humidity, and therefore the sunshine value of any place must be considered not only in relation to the number of hours of sunshine but also in relation to the degree of humidity influencing the extent to which the rays penetrate. The aspect and relation of surrounding hills also influences the humidity according to the winds to which the place is exposed; whether warm and moist or dry and cold: a valley completely sheltered will obviously be more humid than a plateau exposed freely to the currents of air.

Inseparable from the question of humidity is that of rainfall, but heavy rainfall by no means indicates high humidity, so much again depending on whether the water remains on

or near the surface and is evaporated or is rapidly drained away. For instance, Seathwaite and Buxton, two of the most rainy stations, both show very low absolute humidity, but both are on favourable formations. On the other hand, Wryde in the Fens with a very low rainfall shows a very high humidity, and at Lima in Peru, where rain rarely falls, the air is very moist. In Table II. I have arranged the rainfall records for 1899 from 2,586 stations ("British Rainfall," Symons and Wallis) according to altitude, and it will be seen that the figures do not tally entirely with the usually accepted rule that rainfall increases gradually with altitude up to a certain elevation, probably the mean cloud level, and then decreases. Probably we have no stations above this level, the highest being 2,860 feet, but if the stations in the Lake district be excluded from the table the rise is quite uniform, the rainfall in this district being very high—as much as 168 inches in one district.

As has been often pointed out before, the influence of hills is this. Rain-clouds on meeting a range of hills are deflected upwards into the higher regions of the atmosphere, the lower temperature condenses the vapour and causes its precipitation in the form of rain, which generally falls in greatest quantity a short distance from the highest point. The wind most commonly bringing rain in this country is south-west, hence we find the heaviest rainfall in those mountainous districts which this wind first meets, namely, Devonshire, Wales and the Lakes, and in greatest amounts on the eastern and north-eastern slopes of the higher hills. Mountain mists are due to this chilling of air with a high relative humidity; but the heavier rain, I think, is generally at a lower level.

This influence of hills is not easy to demonstrate, for to get a series of stations suitably placed is difficult. A striking example is seen at Eastbourne. Beachy Head at a height of 515 feet intercepts the south-west winds and has a rainfall of 19·17 inches, while Eastbourne on its north-east aspect at a level of from 15 to 86 feet has 25·27 inches. In Cumberland there is a series of stations on the eastern side of Great Gable which is 2,984 feet high, which show from west to east the

following records: Stye Head Tarn, 120·60 inches; Seathwaite, 129·59 inches: Rosthwaite, 107·5 inches; Thirlmere, 84·60 inches.

The district of lowest rainfall is the western half of Norfolk and Suffolk; that of lowest number of rainy days an area north, south and west of London.

The amount of rainfall is an important local factor in climate, but a heavy rainfall, especially on a subsoil of low humidity, is an advantage rather than a drawback from the point of view of health. Sir Herman Weber has said: "Unless rain falls so frequently or continuously as to prevent invalids from spending sufficient time in the open air it has the great advantage of clearing the air from organic and inorganic impurities and probably of rendering it more invigorating by favouring the formation of ozone and diminishing the relative humidity. At any rate, it is a common experience with many people that they feel fresher and more fit for work during and after rain." Angus found an increased amount of oxygen during and after rainy weather; and cool and rainy summers in England show mostly less mortality than dry ones. I have dwelt on this because it seems to me to bear upon the peculiarly bracing effect of certain altitudes in England with high rainfall, but not sufficiently high to be truly mountain climates. They are chiefly on the limestone, millstone grit and older formations.

In dealing with so wide a subject I have only been able to touch upon some of the more important features, each of which is worthy of a paper itself. Local acquaintance with each district, backed by reliable information at a number of selected stations, is desirable to replace our present empirical knowledge of the value of different soils and subsoils by scientific data. What I have said, however, goes far to prove that there is a relation between the nature of the subsoil and the humidity of the air of the district, a fact which, while to some extent recognised in the case of sand, gravel and clay, has not I think, been previously traced out.

To summarise briefly, my contentions are :—

(1) That absolute humidity is one of the most important factors in climate and depends chiefly upon local conditions.

Table I.—Geological Formations in Order of Humidity.

Formation.	Stations.	Humidity Grains per cu. ft.	Humidity of Group. Grains per cu. ft.	Humidity of Group. Mean relative hum. at 98·4
Carboniferous Limestone ...	Buxton	2·98	2.98	15·6 %
	Aysgarth	2·98		
	Rothbury	2·99		
Coal Measures	Wakefield * ...	3·23	3·09	16·24 %
	Ushaw	2·98		
	Bolton	3·05		
Permian { Red Marl ...	{ Appleby	3·11	3·11	16·36 %
	{ Kenilworth ...	3·09		
Permian { Magnesian Limestone ...	Hodsock	3·12		
Iqueous, &c. { Iqueous	{ Seathwaite ...	3·00	3·17	16·68 %
	{ Princetown ...	3·16		
Iqueous, &c. { Lower Silurian ...	Carmarthen ...	3·30		
Iqueous, &c. { Upper ,, ...	{ Churchstoke ...	3·16		
	{ Malvern	3·23		
Triassic { Bunter	{ Cheadle (Tran.) ...	3·03	3·193	16·80 %
	{ Macclesfield ...	3·09		
	{ Scaleby	3·19		
	{ Cullompton ...	3·29		
	{ Chester	3·32		
Triassic { Keuper	{ Rounton	3·10		
	{ Northwich	3·33		
Millstone Grit	Belper	3·10	3·195	16·81 %
	Castle Hill ...	3·29		
Cretaceous	Addington	3·15	3·22	16·94 %
	Berkhamstead ...	3·16		
	Driffield	3·16		
	Bennington ...	3·17		
	Harestock	3·22		
	Beddington ...	3·23		
	Thurlow	3·23		
	Marlborough ...	3·25		
	Hillington	3·27		
	Swarraton	3·30		
Wealden Clay	Tunbridge Wells ...	3·27		
Turassie { Lias	{ Lincoln	3·14	3·22	16·94 %
	{ Cheltenham ...	3·28		
Turassie { Oolites	Apsley Guise ...	3·25		
Tertiary	Norwood	3·21	3·28	17·6 %
	Regents Park ...	3·22		
	Old Street	3·25		
	Somerleyton ...	3·27		
	Southampton ...	3·28		
	Halstead	3·32		
	Strathfield Turgiss	3·32		
	Chelmsford ...	3·33		
Old Red Sandstone... ...	Gurringfed Park ...	3·20	3·30	17·36 %
	Burghill	3·25		
	Ross	3·27		
	Ashburton	3·48		
Alluvium	Wryde	3·41		

* Wakefield is partly on alluvial soil.

TABLE II.—SHOWING RAINFALL AT DIFFERENT ALTITUDES.

(Compiled from "British Rainfall," Symons & Wallis.)

Altitude.	SOUTH EASTERN COUNTIES.		SOUTH MIDLAND COUNTIES.		EASTERN COUNTIES.		SOUTH WESTERN COUNTIES.		WEST MIDLAND COUNTIES.		NORTH MIDLAND COUNTIES.		NORTH WESTERN COUNTIES.		YORKS.		NORTHERN COUNTIES.		WALES.		MEAN ENGLAND AND WALES.	
	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.	No. of Stations.	Mean Rainfall.
Under 100 ft.	125	23·75	50	20·06	73	22·14	56	31·97	21	25·16	48	21·24	48	30·18	35	23·99	15	32·11	31	33·79	502	24·46
100-200 ,,	140	24·69	26	21·45	47	22·76	58	32·75	31	25·04	43	23·48	49	31·85	30	24·06	39	34·60	28	34·38	491	27·22
200-300 ,,	104	25·69	54	21·92	19	20·09	61	33·00	59	26·89	32	26·05	32	35·82	14	25·16	25	54·41	23	43·16	423	29·47
300-400 ,,	66	26·39	47	23·08	10	22·41	48	34·96	41	26·87	25	25·36	22	45·80	42	29·94	23	52·83	17	39·83	341	31·15
400-500 ,,	32	27·69	28	24·07	—	—	29	34·17	39	27·00	14	26·89	21	39·10	30	36·73	14	67·09	16	45·94	233	35·05
500-600 ,,	28	28·33	5	23·21	—	—	21	39·19	24	26·43	12	29·02	18	41·08	31	34·18	14	42·40	20	41·83	173	34·48
600-700 ,,	9	30·71	1	26·91	—	—	15	42·43	13	30·16	2	33·95	16	41·50	20	37·12	11	41·11	11	44·63	98	36·22
700-800 ,,	2	29·67	—	—	—	—	9	42·57	8	28·55	4	31·44	14	43·95	22	39·37	5	43·40	12	51·57	76	40·97
800-900 ,,	—	—	—	—	—	—	6	41·43	4	28·11	1	41·92	10	45·63	25	42·96	8	37·85	5	65·57	59	43·29
900-1000 ,,	—	—	—	—	—	—	2	50·35	1	35·41	4	40·80	10	41·60	17	43·32	1	39·33	8	51·75	43	43·92
1000-1200 ,,	—	—	—	—	—	—	3	38·14	1	24·55	1	39·09	4	49·26	33	42·36	11	88·82	14	57·29	67	53·02
1200-1400 ,,	—	—	—	—	—	—	3	49·82	—	—	—	—	6	37·87	18	44·06	6	34·19	6	60·93	39	44·61
1400-1600 ,,	—	—	—	—	—	—	1	42·63	—	—	2	57·53	1	59·11	7	47·89	2	77·05	8	65·46	21	58·04
1600-1800 ,,	—	—	—	—	—	—	2	39·35	—	—	—	—	—	—	2	47·50	2	101·81	4	55·59	9	56·41
1800-2000 ,,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	86·10	3	59·87	4	66·43
Over 2000 ,,	—	—	—	—	—	—	—	—	—	—	1	56·62	—	—	—	—	3	105·47	3	71·79	7	84·03
																				Total	2586	

(2) That geological formation in its widest sense has a great influence upon humidity, (*a*) owing to nature of surface; (*b*) owing to nature of subsoil.

(3) That the soils most favourable to a low degree of absolute humidity are the impermeable rocks, namely, carboniferous limestone, granite, &c.; the next most favourable are the porous soils so far as they are free from clay, namely, the new red sandstone and the chalk.

(4) The carboniferous limestone is the driest formation.

(5) The amount of rainfall depends on the relation of surrounding hills. High rainfall does not entail a high degree of humidity if the soil is a favourable one and gives greater purity of air.

(6) Altitude increases rainfall but tends to decrease humidity.

Some of these conclusions will be generally recognised, others may be open to modification on further investigation.

DISCUSSION.

Dr. THEODORE WILLIAMS said he was much obliged to Dr. Buckley for his paper, to which he had listened with great interest. He thanked the author very much because he had taken up a particular line which had not been properly worked before. He thought Dr. Buckley had pointed out that the fact that a certain amount of rain had fallen did not prove that the moisture was increased. The rain might all run off, as on a rocky soil, or be retained, as on a clay soil. He would like to ask Dr. Buckley for an explanation of some of the comparisons shown on the large chart. In considering the effect of rainfall at different altitudes, one great factor was the wind, but others were whether the district was mountainous or flat, whether the mountains were near the sea, and whether the wind was from the south-west or east. On these factors the rainfall to a great extent depended. When the district was exposed to the south-west and west winds there was more or less abundant rainfall. If places were not ex-

posed to the Gulf Stream influences there was not so high a rainfall. It was where the warm south-west wind laden with the moisture of the Gulf Stream struck upon the Welsh mountains, which acted as condensers, that such very high rainfall occurred. The same thing occurred in the West of Scotland, which had the second highest rainfall in the United Kingdom. He had written an article on the climate of South Wales in vol. ii. of "The Climates and Baths of Great Britain and Ireland," published by the Royal Medical and Chirurgical Society, and had made out from Mr. G. J. Symons' observations (who was the author of the great works on rainfall which he had put at Dr. Williams' disposal), exactly how the rainfall prevails. There were a great many different soils in Wales owing to the variety of geological strata, but few of them retained moisture to the same degree as a stiff clay soil. He thought the account of the increase in the rainfall very interesting, and Dr. Buckley had turned it very well to account. It was such a large subject that he almost wished Dr. Buckley had taken one or two districts only, and not extended his researches all over England. The geological district he knew very well himself was that of the lower green-sand and the upper green-sand in Surrey, Sussex and Hampshire. The rainfall was not very high, but one wanted to know what became of it. In the summer the rain sank in so quickly that one could lie on the ground directly after a shower. Dr. Buckley could not be expected to do everything, but he hoped he would extend his researches a good deal further on the same lines.

Dr. CLIPPINGDALE had been very much interested in Dr. Buckley's paper. It seemed to him to corroborate what he (Dr. Clippingdale) had pointed out in his own paper, namely, that valleys generally contain the best soil but the worst air. The paper also fully supported work done by two eminent members of the Society, namely, Mr. Haviland in his "Treatise on the Geographical Distribution of Disease," and Dr. Theodore Williams in his valuable observations on the climate and sicknesses of South Wales. It was possible to get two very different

climates in the same place, as at Malvern, where the Malvern ridge running north and south afforded to Great Malvern, which was on the east slope, a bracing and cold climate, but to West Malvern on the west slope a relaxing and warm climate. The difference in the vegetation on the two sides was most marked.

Dr. THOMPSON (Buxton): The higher rainfall on the west coast was compensated for by the configuration, the hills causing rapid evaporation and drainage with no increase of relative humidity, particularly noticeable in limestone districts. In Buxton, situate partly on limestone and partly on millstone grit, most of the springs are on the latter, the ground water being nearer the surface; on the limestone hills a heavy rainfall meant good crops.

Dr. TYSON (Folkestone) said that some years ago he had attempted a paper on the diseases that occurred at different times of the year, taking into account the amount of rainfall and the direction of the wind. It was an exceedingly difficult question to work out. What kind of diseases were prevalent to certain soils, and how the wind and various local influences operated. With reference to Romney Marsh, to which reference had been made, he would mention that since the drainage there had been improved the disease of ague had entirely disappeared. He mentioned this as an example of what good result had followed from drainage, and he thought equally good result ought to follow from a paper such as the one Dr. Buckley had just read, which had an excessively practical bearing on the whole subject matter. Forty years ago people took quinine without consulting doctors for this disease as a matter of course.

Dr. LEONARD WILLIAMS was pleased to be able to add his own to the congratulations offered by other speakers to the reader of the paper. The question of humidity was one of the most important factors which the climatologist had to consider, and it was very unfortunate that there was no recognised standard of comparison. For example, some people seemed to imagine that rainfall and humidity were interchange-

able terms, a fallacy which a very elementary acquaintance with meteorology would suffice to dispel. Then there was the chaos brought about by the difference between absolute humidity and relative humidity. These conditions, though christened alike, had no relation whatever to one another, so that when the word humidity was used it was very necessary to specify which variety. When speaking of humidity he always thought of relative humidity, which, if all that was said about it was to be believed, was, when high, a very obnoxious quality. He thought this was a very undiscriminating attitude to adopt. A high humidity was always present in equable and so-called relaxing climates; but as these climates, though subjectively less agreeable than bracing climates, had nevertheless very conspicuous merits of their own, it was a mistake to abuse them on account of their essential quality, namely, a high relative humidity.

Dr. FORTESCUE FOX thought that the observations of the last speaker with reference to the geographical distribution of humidity were quite correct. The variations in the relative humidity of different places in the same districts were sometimes very erratic. In a paper read by Mr. Bayard before the Royal Meteorological Society so lately as last June, he stated that he could not profess to explain the anomalies of humidity. Even in travelling from east to west there were many exceptions to what Dr. Williams had cited, and what was generally supposed to be the common rule. We thus had the highest meteorological authorities stating that the distribution of humidity could not be explained, and, on the other hand, Dr. Buckley coming forward with a new thesis and saying that humidity was a matter that varied with the subsoil. If that were demonstrated to be a fact, it could not be denied that it was a fact of very great importance. Before, however, they accepted the proposition that humidity was even related to subsoil they should, he ventured to think, want more convincing evidence than Dr. Buckley had brought before them. He did not think the paper had made it quite clear in what manner the degree of humidity was affected by

subsoil. A considerable amount of evaporation took place from the soil depending partly on the respective temperatures of the soil and the air. Dr. Buckley had not dwelt upon the differences of temperature in different soils. As regards clay, chalk and sand, at the depth of a foot, the mean temperature of sand was higher than that of the air; chalk was about the same temperature; and clay, again, was on the average colder by about one degree than the air above it. It was an interesting and important fact that the power of absorption possessed by these different soils varied so greatly; but it was not quite clear how the superincumbent air was affected by these factors, because the proportions of absorption by the soil did not in the various districts dealt with correspond to the humidities of the overlying air. Dr. Buckley had alluded to an exceedingly interesting thing—the amount of sensitiveness of living organisms to the soil—a point to which he (Dr. Fox) attached considerable importance. As regards vegetable organisms, it was well known that crops ripened more quickly on some soils than others under similar conditions on contiguous lands. Human beings also, especially when possessed of particular ailments, were sometimes peculiarly sensitive to influences of soil. In living organisations we had, in fact, instruments of far greater delicacy and precision than anything science had ever given them.

Dr. BUCKLEY, in reply, said he very much appreciated all that had been said upon his paper, in which, as he was conscious, there were many deficiencies. These were due to the great extent of the subject he had taken up which rendered it impossible to deal with it in detail in the time at his disposal. The theories he had put forward were, he believed, so entirely novel that it was necessary to deal with the whole range of geological formations rather than with any one in detail in order to establish his position, and for the same reason he was obliged to confine his attention entirely to the physical aspect. He hoped, however, that he had aroused sufficient interest to induce others to make detailed investigations of the effects upon climate of the formations and subsoils with which they

were acquainted, for it was beyond the scope of any one individual to deal fully with so many varieties as were found in this country. The therapeutic effect must also be investigated on a future occasion and would, he was sure, be of much interest and importance. While paying most attention to the districts of low humidity he did not wish to detract from the value of moist climates, but the moist climates of therapeutic value were those which owed their humidity rather to moisture-bearing winds than to dampness of subsoil. He had also endeavoured to make it clear that the absolute humidity was a more important feature than relative humidity, and also the one from which more accurate conclusions could be drawn as to the character of the climate. From lack of time he had been obliged to omit any reference to the influence on rainfall of any other factors than those of configuration, but he thought the influence of the west coast would be obvious from the table he presented. With regard to the question of the temperature of the soil, he had no statistics at hand, but hoped some other Fellow of the Society would take up the matter.

Original Communications.

EXERCISE IN THE TREATMENT OF PHTHISIS.

BY H. LAING GORDON, M.D.(EDIN.), (FLORENCE, ITALY).

THE coming and going, the appearance and disappearance, of remedy after remedy, regimen after regimen, recommended as a specific for a disease, is always faithful evidence to the student of the history of treatment of perennial difficulty in dealing with that disease. But in the case of *phthisis pulmonalis* it is something more. It is an illustration of the fact that, while the main principle of a treatment may for a century vary only in the terms by which it is expressed, practice changes from decade to decade in bewildering fashion with total disregard of protests by acknowledged authorities.

"The advance of our pathological knowledge," says the writer of the essay which gained the first prize in the recent competition in connection with the King's Sanatorium, "during recent years has made it possible to formulate the real principles upon which the treatment of this disease should be based." A more liberal view, however, would acknowledge that the leading principles of modern treatment are based upon those held for a century at least by enlightened physicians now confirmed by pathological investigation.

What is the fundamental principle on which the modern treatment of phthisis is founded?

In the article on Phthisis Pulmonalis in Allbutt's "System of Medicine" we find the following concise statement: "As we have no specific remedy our aim must be to increase as far as possible the resisting powers of the patient." Dr. Latham in the prize essay accepts with correct modern modifications the principles laid down by Brehmer, insisting not only on the law just quoted but also on placing the patient in an environment which reduces to a minimum or even excludes*

* Dr. Latham even goes the length of asserting that the micro-organisms which cause complications "such as cold or an attack of pneumonia" can be altogether excluded from a sanatorium.

every circumstance which leads to a diminution of resistance. "We see, then," he says, "that the best conditions not only for preserving and strengthening the resistance of the body to the inroads of the disease, but for the ready destruction of the tubercle bacillus itself, are obtained by an open-air life."

Let us now go back to an authority who wrote before Koch's discovery of the tubercle bacillus, presumably the date (1882) of the beginning of the pathological knowledge on which we now base action; it must be remembered that Brehmer's views were formulated before 1882, although his book was published in 1886.

Niemayer said that the patient "should be placed, if possible, under influences calculated to invigorate the constitution and to extinguish the morbid tendency." He followed this enunciation with instructions for hygienic measures, giving prominence to out-door life and the supply of fresh air. Unfortunately in Niemayer's day our profession loved its drugs too dearly and the public feared cold and exposure too obstinately to allow of his views being developed.

Graves, who wrote about twenty years before Niemayer, referred to the absurdity of prevailing treatment. "A rational physician," he said, "will endeavour to prevent (the disease) not by confining his patient but by hardening him against cold." He extended this principle of prevention to treatment of the disease and narrated instructive cases of recovery. If we go further back to the very beginning of last century, far away from modern pathological knowledge, we find the same principle enunciated even more emphatically. Dr. Benjamin Rush, of Philadelphia, an eminent physician of his day, wrote that "the most probable method of curing consumption is to revive in the constitution that vigour which belongs to the Indians or to mankind in their first stage of civilisation."

If then the prize essays summarise the latest views, we find little difference between modern principles and those of one hundred years ago. To speak of *strengthening the resistance* of the patient instead of *invigorating his constitution* is

but to alter a term to meet modern pathological views. Both are examples of the vague expressions commonly used in medicine to indicate conditions which we do not understand thoroughly. Niemayer and Graves possibly saw further than Rush, and suspected an external as well as an internal influence; the treatment of all of them was similar, and was effective equally against the constitutional debility and the external morbid influence. Even before the discovery of the tubercle bacillus the climatic treatment of phthisis was carried out in such a manner as suggested suspicion of an external influence. Koch's discovery threw the treatment of phthisis into confusion and for a time threatened to overwhelm the growing rational treatment by the use of antiseptics and the fruitless search for an effective serum.* But the failure of these and the steady persistence of such men as Brehmer called the best thought of the profession to hygienic measures.

If it is asked why to-day we are able to carry out the scientifically developed measures which were advocated so long ago but met with small encouragement, the answer is easy. The public mind has been educated gradually to a knowledge of the value of fresh air, good food and sunshine—educated so successfully that the taught even turn upon the teachers and accuse them of ignorance. Thus it is that the general practice in the management of phthisis has at last been brought into line with the principles laid down by those who have given most thought to the subject.

The opinion that the sanatorium treatment of phthisis is superior to all of its host of predecessors has taken firm hold, and royal patronage has gone far towards fixing the practice. Not one of the prize-essayists considered it necessary to discuss this aspect of the subject in detail—an omission which the historian of the future may condemn. Dr. Latham properly points out the difficulty in comparing statistics of sana-

* There is evidence to show that immunity cannot be acquired, by serum or otherwise, against a disease of which one attack, by lowering the constitution, weakens rather than strengthens against subsequent attacks. Tuberculosis is such a disease.

toria one with the other when they calculate after diverse methods; but his summary of sanatorium results (Appendix II.) might be compared by those interested with the results from high-altitude treatment published by Dr. Theodore Williams.* The bare statement that sanatorium treatment is the best, and a passing reference to Solly's observations is insufficient. A great deal more is required in the statistical line. It is surprising that some business-like municipality or philanthropist has not asked for these.

Dr. Latham pays a just tribute to Bodington and Brehmer, but it is a pity he should follow Brehmer in the loose use of the term immunity. He speaks of open-air conditions conferring *immunity* from phthisis. Now immunity from a disease is one thing and freedom from a disease is another. Freedom from phthisis may be enjoyed in a suitable environment, but no environment confers immunity. A patient remains apparently immune to phthisis while in his sanatorium, but on return to his old surroundings it becomes evident, when he relapses, that his immunity was not real, it was only freedom. True immunity arises only through the slow and secular action of natural selection; but this question is beyond the scope of the present article. I desire only to draw a possible lesson from one of the early writers whom I have already quoted.

Dr. Rush insisted, as I have said, upon the value of restoring the vigour of the constitution in phthisical patients. But he insisted more strongly that this must be done *by means of exercise and labour*. His remarks certainly take the form of a special plea, but read in the light of modern knowledge they are of more than literary interest. I cannot do better than to reproduce his words:—

"I shall begin my observations upon consumption by remarking: (1) That it is unknown among the Indians in North America; (2) it is scarcely known by those citizens of the United States who live in the first stage of civilised life

* "Aërotherapeutics," p. 114.

and who have lately obtained the title of the first settlers. The principal occupations of Indians consist in war, fishing, and hunting. Those of the first settlers are fishing, hunting and the laborious employments of subduing the earth, cutting down forests, building a house and barn, and distant excursions in all kinds of weather to mills and courts, all of which tend to excite and preserve in the system something like the Indian vigour of constitution. (3) It is less common in country places than in cities and increases in both with intemperance and sedentary modes of life. (4) Ship and house carpenters, smiths and all those artificers whose business requires great exertions of strength in the open air in all seasons of the year, are less subject to this disorder than men who work under cover, and at occupations which do not require the constant action of their limbs. (5) Women, who sit more than men, and whose work is connected with less exertion, are most subject to consumption.

"From these facts it would seem that the most probable method of curing consumption is to revive in the constitution, by means of exercise or labour, that vigour which belongs to the Indians or to mankind in their first stage of civilisation. The efficacy of these means will appear when we enquire into the relative value of the several methods which have been used by physicians in this disorder. I shall not produce among these remedies the numerous receipts for syrups, bolusses, electuaries, decoctions, infusions, pills, medicated waters, powders, draughts, mixtures and diet-drinks, which have so long and so steadily been used in this disease; nor shall I mention the best accommodated diet submitted to with the most patient self-denial; for not one of these all without the aid of exercise has ever, I believe, cured a single consumption."

Rush, then, enumerates various treatments, sea-voyages, change of climate, journeys, vomits, blood-letting, bitters, perspirations, blisters and setons, and argues that these have succeeded in many cases certainly, but only because they permitted exercise or increased the power of taking exercise;

plausible, no doubt, but earnest. "Dr. Gordon, of Madeira," he says, "ascribes the inefficiency of the air in Madeira in consumption in part, to the difficulty patients find of using exercise in carriages, or even on horseback, from the badness of the roads." He concludes these remarks with the following: "The effect of *swinging* upon the pulse and respiration leaves us no doubt of its being a tonic remedy and a safe and agreeable substitute for exercise;" he then relates several cases of cure through exercise and labour, one of which is especially interesting, historically at least.

"Case by Dr. Benjamin Franklin. I shall add only one more case lately communicated to me by the venerable Dr. Franklin, whose conversation at all times conveys instruction, and not less in medicine than upon other subjects. In travelling many years ago through New England the doctor overtook the post rider, and after some enquiries into the history of his life, he informed him that he was bred a shoemaker, that his confinement and other circumstances had brought on a consumption for which he was ordered by a physician to ride on horseback. Finding this mode of exercise too expensive he made interest upon the death of an old post rider to succeed to his appointment, in which he perfectly recovered his health in two years. After this he returned to his old trade, upon which the consumption returned. He again mounted his horse and rode post in all seasons and weathers between New York and Connecticut River (about 140 miles), in which employment he continued upwards of thirty years in perfect health."

I was led to think of the value of exercise in the treatment of phthisis by reading in a little quasi-medical publication of 1825 the details of a successful plan of curing consumption adopted by one Dr. Stewart. This gentleman "directed his patients to go to bed at 10 o'clock and rise at 7 or 8. After breakfast the patient, lightly clothed, rides out on horseback or he walks or exercises himself with a swing for an hour or two, or till slight weariness comes on. Where the cough is violent swinging is preferred. The same exercise is pursued both in summer and winter, the clothing being adapted to the

temperature of the atmosphere, so that the state of the weather does not in any case confine the patient within doors. When the patient suffers from hectic fever, the cold shivering of which usually comes on about noon, the time of the morning's exercise is to be so arranged as to fall in with the period at which the shivering takes place." Stewart himself, however, seemed to ascribe the virtue of his treatment not to this hygienic method but rather to the daily rubbing of the skin with equal parts of vinegar and water "until it is quite dry and glowing." I confess that at first I regarded Stewart's plan as one of the curiosities of medical literature; I classed it with John Wesley's advice to consumptives to cut out a piece of turf from the ground every day and lying down to place the mouth in the hole and inhale deeply; and with his final injunction "in the last stages to suck a healthy woman daily."

On reflection I reasoned that the exercising of the muscular system was a rational portion of a treatment having for its object the invigoration of the constitution or, in modern language, a strengthening of the resisting powers of the patient. In the *Lancet* of February 26, 1896, I recorded a small series of cases of phthisis treated in an open-air climate, in practically all of which I advised and saw performed regular daily physical exercise—generally walking or horse-riding. From this experience I formed the conclusion that exercise, hard exercise in suitable surroundings, may well be a feature of the preventive treatment of phthisis, and that exercise involving more or less physical exertion should never be omitted from the treatment of incipient or quiescent phthisis.

Since 1896 I have been struck by the extreme caution with which writers on the open-air treatment speak of the value of exercise. In practice I have found that patients whom I have sent to sanatoria in the incipient stage have been put through a process akin to that of fattening animals for market; the acquirement of adipose tissue appears to be valued more highly than the healthy development of muscle. It is satisfactory to find a statement on this subject in Dr. Latham's

admirable essay, and a valuable appendix summarising the practice of a number of sanatoria in regard to exercise. His own views exhibit a well-reasoned advance on the rest and fattening system; but he shows that no definite opinion exists on the subject. My own experience led me to question whether the usual guide in the employment of exercise, the temperature of the patient, is a good guide. The value of exercise in the treatment of phthisis and the effect of exercise upon the temperature of the phthisical, might form subjects for discussion by our Society with those who have studied the subject. Any statement regarding rise of temperature in the phthisical after exercise should be accompanied by observations on the hourly fluctuations of the temperature in similar cases without exercise, and by references to researches on the fluctuations observed in healthy persons after exercise.

Common experience regarding the value of exercise should not be disregarded. Franklin's case would not be considered unusual in many a British Colony. In South Africa I came across several settlers whose recovery had been due to hardship and labour in suitable surroundings; I believe that the late Mr. Cecil Rhodes was a conspicuous example. A trek up country with a bullock waggon for house and home has cured many an incipient case of disease.* On the other hand South Africa was, and no doubt is still, plagued by the visits of numerous advanced unsuitable cases sent out too late and only to die.

The value of sanatorium treatment is beyond doubt; but as yet I find no proof of its pre-eminent superiority over the ordinary climatic treatment with exercise, *in cases suitable for either method.* Whenever choice is allowed the climatic method will prove more attractive to the vigorous British body and mind. " If you can't keep me clear of bacilli with-

* I remember my astonishment on examining the chest of a robust looking farmer, whom I recognised as a former patient, with well marked apical disease, hæmoptysis and afternoon rise of temperature, who had treked to Rhodesia with a waggon against my advice and that of a colleague.

out all these regulations," said a patient, "let me go to a country where there are none;" and he added heterodox remarks on the illogicality of gathering patients together and trusting to artificial regulations as a protection against the elusive bacillus; a moment's neglect being capable of scattering a myriad of germs. Patients return from sanatoria complaining of the dull, small life they have had to endure; I fear, from a perusal of the prize essays that boredom and regulations are on the increase; to dub them scientific does not render them more agreeable. The medical officers are to be allowed billiards and tennis, but the patients must be content with grudgingly allowed "putting" and croquet; and ping-pong in the open is conceded on the condition that a medical officer is at hand to take the temperature—a proceeding which would no doubt increase the excitement of many a game, but would necessitate a revision of the rules. It is, however, fair to remember that in Dr. Wethered's well-judged essay, which gained the second prize in the King's competition, on the whole more liberal views on exercise are expressed than in the first prize essay. But it is obvious that all the essayists treat exercise as by no means a prominent part of the system and share the prevalent cautious opinions on the subject.

The characteristics of the Britisher will have altered indeed if he is found to prefer to obtain his suitable environment under restrictions obnoxious to the national temperament rather than in the free air of a colony or of a country where he can live, recreate, and even work, without being harassed at every turn by regulations and reminded of his disease in a truly Teutonic fashion. (*Vide* Dr. Latham's paragraph on Daily Routine.)

There are many points in the three prize essays which provoke comparison and should be discussed. Dr. Latham's remarks on exposure to sun, in which that body is reduced to the small dimensions of an "amenity and a cordial" might be enlarged upon; I do not doubt that the author can refer us to records of cases proving this insignificance of the hitherto

apparently overrated heavenly orb. But it is a consolation for the present to find that the only prize winner who appears to speak from a practical knowledge of sanatorium treatment insists on obtaining "a maximum of sunshine." In the first two prize essays we have the very best statement of the theoretical standpoint; it will be a pity if we have not the opportunity of learning from a perusal of a few of the best of the unsuccessful essays, the views of physicians who have, like the third prize winner, Dr. Morland, had practical experience. Perhaps it is as well to state that I was not a competitor and that my interest in the subject is the common one of the physician who is accustomed to meet phthisis at its outest, and desires to be acquainted at once with the most suitable treatment for each case; it is from this point of view and from the added curiosity of one interested in the history of medicine and treatment, that I have written.

I have referred to the immense advance in education which has facilitated the development of the open-air treatment of phthisis so ably set forth in the prize essays. This advance is but a step; the next should lead us nearer still to the prevention of the disease. The present generation of physicians fulfils a high duty in merely shouting on the housetops that phthisis is preventible—preparing the way for the work of succeeding generations. The success of sanatorium treatment will further impress on the public the importance of a healthy environment and will lead it, in the course of time, to insist that the suitable environment shall be found not only in the sanatorium and far away colonies, but also in the home, the school, the workshop and the office. And there is even hope that in time the claims of those who now speak of the further necessity for artificial selection against the disease will be listened to—and understood.

THE NERVOUS CARDIAC SYMPTOMS OF HIGH ALTITUDES.

BY F. SAVARY PEARCE, M.D.
PHILADELPHIA.

It was my privilege last year to present the subject of the "Influence of Climate upon Nervous Diseases considered from a Physiological Standpoint,"* in continuation of a series of studies first begun during extended travel through New England, Canada and the West, and first brought together in a paper entitled "The Climatology of Neurasthenia,"† presented before the Medical Society of the State of Pennsylvania, September, 1900. It has been satisfactory to see that the line of thought presented has met with some approval by the profession. The interest of the subject is only surpassed by the difficulty of determining accurate scientific facts. Nevertheless we feel that certain physical conditions obtaining as regards atmospheric pressure, winds, altitude, &c., materially influence the normal human body and also very much more pronouncedly the sufferer from disease, particularly diseases of the nervous system, functional or organic.

The Effect of Altitude upon the Heart in Normal People.—The physiology of the normal person is so nicely adjusted and resilient, so to speak, that changes of altitude in healthful countries, when not made suddenly and not of too great height, say up to 5,280 feet, about that of Denver, will certainly not be found to disturb them in the least. This I have had noted from personal experience and from that of many others; and even at the altitude of Las Vegas, New Mexico, which is 6,398 feet above sea level, I have known normal people who experienced no discomfiture whatever. At the altitude of Pike's Peak, over 14,000 feet, we all know from our friends who have visited that height that disagreeable sensations and palpitation

* *New York Medical Journal*, October 5, 1901, and vol. xvii. of *Transactions of the American Climatological Association.*

† *Medical News*, January, 1901, and *Transactions of the Pennsylvania State Medical Society*, 1900.

of the heart occur in many. The tendency will be, however, as we ascend to produce a more easily excitable heart in normal persons, due, in a measure, to the increased peripheral circulation through the lessened *vis a fronte.* This, continued through generations, may in turn be the cause of dwarfism, as shown in the Thibet men—likely on account of the fact that the important organs of body metabolism, as the liver, are less constantly kept flushed with fresh blood, and therefore the important chemical changes necessary for bodily growth do not occur. *A priori,* it seems patent that the best type of human physical being will be from a stock whose lineage has for many generations lived by hard manual work, associated with acute mental calculations; and on moderately high plains, as in our Western States, at the foot-hills of the Rocky Mountains. The theory recently promulgated by Loeb and Matthews tending to prove an electric energy as nerve force, if ultimately found to be correct, may awaken renewed investigation towards solution of this perennially interesting problem of functional nervous disease, and therefore functionally perverted action of the heart here considered.

The Effect of Altitude upon the Heart in Functional Nervous Disease.—Since so much of the successful treatment of disease of the mind and nervous system depends upon remedial measures to which drugs are the important adjuncts, it falls true that changes of season, climate, &c., are the fundamental conditions controlling many diseases. Considering the subject in hand, *i.e,* the possible affection of the heart due to altitude, we have to bear in mind at first that the nervous heart so-called is entirely dependent upon the condition of the nervous system; and that in neurasthenia, for example, the rapid irritable heart is a frequent accompaniment. The conclusions we drew as to the latter disease will still be in force for the "irritable heart," viz., "It is almost axiomatic that an altitude of over 2,000 feet is unsuitable for the neurasthenically disposed or convalescent patient. Any very 'stimulating' climate should be avoided. Other conditions to be avoided are as follows: Districts menaced by high winds and frequent fogs; cloudy saturated atmospheres with but slight movements of air, low country (sea level) with continuous, non-varying although moderate heat. Thus the

Bermuda Islands and Florida are enervating localities. Ideal conditions for the neurasthenic include sea air in a well-wooded country far enough from the coast to avoid its fogs. A sea voyage is, as a rule, an excellent preliminary to other climatic measures. Provided the voyage be not stormy, it acts both physically and psychically in soothing the nervous system. In order to obtain the full benefit of correct climatic conditions the patient must have good food. Without this important adjunct the desirable climatic change may be entirely defeated in its effect on the patient."

The paper on the "Blood Count in High Altitudes," read before the Association at Niagara Falls by Dr. W. A. Campbell, assisted by Dr. H. W. Hoagland, gives some further clue to the solution of mechanism of the effects of high altitudes upon the cardio-vascular system, and as stated in the discussion of that paper, the writer still believes that the sensible perspiration carrying off much of the waste products of the body is of benefit to nervous individuals when autointoxication is coexistent. Also that at high altitudes increased sensible and insensible perspiration occurs according as the air is moist or dry, and that as a rule, therefore, the cases of idiopathic nervousness or essential neurasthenia will do better at the lower altitudes suggested. The decrease of atmospheric pressure at altitudes above 6,000 feet certainly does in some way unknown as yet tend to weaken the inhibitory ganglia of the cardiac muscle. Yet it will not be fair either to compare physical experiments with actual facts as determined by clinical observation of the effect of heat loss, since the human body is entirely different from any inorganic mass; hence if in a phial of water it be found that the liquid loss is more rapid at sea level, the human body will do likewise. The element of complete metabolism is so interwoven with health that the effect of height with its associated winds and temperature will prove of value only as they are constant and active agents towards a better internal absorption of food products. Nor is it necessarily so that an irritable heart which the patient describes will ultimately prove to be an irritable heart by the *continuance* of the climatic conditions, among them altitude, which seems to be and indeed is, often the etiological factor for this condition. It may be in some cases that

this disagreeable affection of the cardiac muscle will have to be gone through with before the patient can come to a fundamental condition of good health. I have a case at the present time of a young lady suffering from hystero-neurasthenia with disagreeable and at times dangerous herpetic eruption upon the vocal bands where Dr. E. B. Gleason excluded any organic disease of the vocal cords, and where rest treatment associated with mental therapeutics had bettered her condition much. I sent her to Las Cruces, New Mexico, at an altitude of 3,730 feet above sea level, where an irritable condition of the normal heart-muscle was nicely shown to have been produced within a week; although her general nervous condition, it may be stated, was definitely improved, probably due to the dryness of the atmosphere itself. A letter received May 26, 1902, gives a better report, namely, that the heart symptom has abated, her condition of general nervousness much improved and the attacks of laryngismus almost cured. It has taken about ten weeks for the young lady to become accustomed to the great physiological change in her system, and it will be my advice to continue for a year or so in the climate and altitude which seem now to be doing great good. An analysis of this case would seem to justify the conclusion that the neurasthenic condition was an *essential* one, *i.e.*, not due to any tangible toxic or other cause, and that the altitude of over 3,000 feet, which, as I have already stated, is not, as a rule, good for the nervous individual, or his cardiac symptomatology, must have in this patient through the dry atmosphere favoured better metabolism and lessened the expenditure of nerve energy in that direction. I would say that, in a simple case of neurasthenia with irritable heart, a patient will usually experience considerable palpitation and cardiac distress when ascending above 2,000 feet; but, if high winds do not prevail, I conclude that the patient will be ultimately benefited if the general nutrition improves as shown by gain in weight taken in actual week-to-week records. In that enigmatic disease hysteria alone, the effect on the heart will depend, therefore, very much upon the tendency towards normal metabolism produced at high, dry altitudes. It has been my experience, too, in partial proof of this that people living at moderate heights in the coast region

or mountains in the north-western United States, at a moderate altitude of 1,000 to 1,500 feet, have more quickly and permanently produced palpitation and tachycardia, due undoubtedly to less active metabolism in this moist climate. At an altitude of 2,000 feet, as at Tim Pond, Franklin County, Maine, the dryness of the climate produces the better effect in nutrition, and nervous people there do not experience any cardiac distress; while in the same altitude in the Adirondacks, associated with greater moisture, it will be unfavourable to nervous disease and irritability of the heart action, which has been found by me to be a prominent feature of the cases studied in the Empire State. The pine regions of Georgia and North Carolina, back from the coast and at an altitude of somewhat less than 2,000 feet, do not produce any nervous cardiac symptoms; while the damp low country in Florida will produce both mental distress and a subjective feeling, at least, of cardiac distress.

Effect of Altitude upon the Heart in Organic Disease of the Nervous System.—The affection of the heart in organic diseases will depend upon the site of the lesion in the brain or cord, and in affections of the cardiac muscle or endocardium in association. Taking first the sclerotic diseases of the cord, it is certain that the heart regulating mechanism will be more profoundly disturbed in these diseases, particularly ascending scleroses, as in the cases of amyotrophic lateral sclerosis, glosso-labio-pharyngeal paralysis, or even in cases of chronic multiple neuritis, wherein by continuity of the inflammatory process the pneumogastric or phrenic nerves may be susceptible to the continuance of inflammation to them, and therefore to pneumo-cardiac control.

Any change of altitude is, therefore, to be very carefully considered in relation to the rhythm of the heart, the absence of cardiac disease, &c. With a normal heart and degeneration of the lower cord, as in tabes, a moderate altitude as of 2,000 feet will do good only in relieving the heart from over-work through the increased peripheral circulation; therefore, in any organic disease of the brain or cord, in the writer's opinion, high altitudes should be eschewed for the reasons given. The effect of altitude upon disease of the heart seen in general

medicine will be favourable in cases of hypertrophy, it seems to me, when due to resistance in the course of the circulation peripheral to the capillaries, as in Raynaud's disease and angioneurotic œdema. In disease of the endocardium, as in valvular disease without loss of compensation, moderate altitude should be insisted upon. In cases in which there is loss of compensation, as shown by œdema, chronic gastritis, renal congestion, &c., an altitude of 2,500 feet or more in a dry climate will undoubtedly prove of value in the majority of cases. Cyanosis, therefore, is not always a contra-indication to moderate altitudes.

It is not considered necessary to urge here the importance of the hygienic bearing of the case of heart disease in any altitude, and especially is this desirable to be kept in mind by the physician when the patient changes his environment. Emphysema, particularly if associated with asthma, will often be benefited by the high, dry altitudes, since the interchange of oxygen by the more rapid respiration induced will the better oxygenate the blood, and in this wise relieve the over-acting heart-muscle.

Prognosis and Treatment.—In cases of heart disease these will be more certainly determined and perhaps materially changed when recognition shall have been given to this important branch of climatology presented for your consideration.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

COPY OF MINUTES.

GENERAL Meeting held at 20, Hanover Square, Wednesday, December 27, 1902, at 8.30 p.m. The President, Dr. SYMES THOMPSON, in the Chair.

The minutes of the last meeting were read and confirmed.

The balance sheet appended was presented and adopted by the meeting.

ORDINARY Meeting held at 9 p.m. The President, Dr. SYMES THOMPSON, in the Chair.

The minutes of last meeting were read and confirmed.

The following candidates were nominated for election at the next ordinary meeting :—

John Temple Leon, M.D., B.Sc., D.P.H., Southsea.
O. E. Powell, M.D.(Paris), Jersey.
Gawler Murray, L.R.C.S., L.R.C.P., L.F.P.S., Scarborough.
H. B. Treherne Symons, L.R.C.P., L.S.A., Naples.

The following candidates were elected by ballot :—

Percy Newell, L.R.C.P., L.R.C.S., Crowborough.
Nicolas Elrington, B.A., L.R.C.P., M.R.C.S., Leamington.
Percy Athelstan Nightingale, M.D.(Edin.), Harrogate.
David Hugo Daniell, L.R.C.P., L.R.C.S., London.
John Morgan Owen, L.R.C.P., M.R.C.S., Fishguard.
Douglas A. Reid, M.D., M.R.C.S., L.S.A., Tenby.
Ernest Mansford Knowling, M.B., B.A., M.R.C.S., Tenby.
George R. E. Bonsall, L.R.C.P., L.R.C.S., Aberystwith.
Lionel Alex. Weatherby, M.D., M.R.C.S., Bath.
Ernest E. Lewis, M.D., M.R.C.S., L.R.C.P., London.
William Henry Hewlett, M.D., D.P.H., Wivenhoe.
Henry Edmund Symes Thompson, M.A., M.R.C.S., L.R.C.P., London.

Dr. PERCY LEWIS (Folkestone) read a paper on "Convalescence and Chronic Illness."

The following Fellows took part in the discussion : Drs. Groves (Carisbrooke), Snow (Bournemouth), Harry Campbell,

Begg (Bath), the President, Fred Gardner (Bournemouth), Bagshawe (St. Leonards), Leon (Sidmouth).

Dr. Percy Lewis replied.

Copy of Minutes.

Ordinary Meeting held at 20, Hanover Square, at 5.30 p.m., on Wednesday, January 28, 1903. In the absence of the President the Chair was taken by Dr. Bowen Davies (Llandrindod Wells).

The following candidates were nominated for election at the next meeting:—

Arthur Walter Sykes, M.D. (Lond)., M.R.C.P., F.R.C.S., London.
John English Harburn, L.R.C.P., L.R.C.S.Ed., Buxton.

The following candidates were elected by ballot:—

Gawler Murray, L.R.C.S., L.R.C.P. (Edin.), L.F.P.S., Scarborough.
John Temple Leon, M.D., B.Sc.Lond., D.P.H., Southsea.
H. B. Treherne Symons, L.R.C.P., L.S.A., Naples.
O. E. Powell, M.D.(Paris), Jersey.

Dr. Buckley (Buxton) read a paper entitled "Local Factors Influencing Climate, with special Reference to Subsoil."

The following took part in the discussion: Drs. Theodore Williams, Clippingdale, Geo. Thompson (Buxton), Leonard Williams, Tyson (Folkestone), Fortescue Fox.

Notes from the Spas and Sea-side Stations.

Llandrindod Wells.

Llandrindod Wells, "the hygienic capital of Wales," as it has been called, is situated on an open common, over 700 feet above sea-level, and is surrounded by hills which, though some miles away, and not high enough to encourage the long continuance of snow, yet serve as a shelter from cold winds.

The climate is mild but bracing, and the air pure and fresh, for the prevailing wind coming from the south-west blows direct from the coast-line without any intervening town or population to rob it of its purity, or lessen the ozone it contains.

Mists and fogs are almost unknown, and the rainfall is small, the average for the last ten years being 33·4 inches, considerably less than that of the western counties of Britain.

On the other hand, the amount of sunshine which Llandrindod enjoys is above the average, but even in the middle of summer the fresh breezes blowing over the common prevent the heat from becoming oppressive.

The springs of mineral water for which Llandrindod is noted, are seven in number, and may be divided into four classes, saline, sulphur, chalybeate and magnesium. These waters are used both for bathing and drinking purposes, but chiefly the latter. Within the last two years new baths have been erected containing all the latest improvements and appliances. They include the Russian vapour bath, vapour bath, spinal douche, circular needle and shower bath, and Dowsing radiant heat bath.

The season at Llandrindod extends from the last day of March to the first of November, though even in the winter months the town is not without its visitors.

The residents of Llandrindod number about 2,000, and it has been estimated that over 70,000 people visit the place annually; the number is steadily increasing season by season. Of these, many come for their health, and many also to enjoy the varied amusements which Llandrindod affords.

Boating may be obtained on the Lake, where races and regattas are held during the summer months There are excellent golf links, tennis courts and croquet lawns.

The River Ithon and the Wye some few miles distant, afford ample opportunity for really good fishing, while for those who prefer more active forms of amusement there are innumerable hill walks and excellent driving and cycling roads.

Almost every evening concerts and entertainments are held in the Albert and Victoria Halls, and the Pump House and Park bands play at intervals during the day.

The electric light installation at Llandrindod is a particularly good one, and within the last year telephonic communication has been established with the outer world, greatly to the convenience both of visitors and residents.

Llandrindod is amply supplied with excellent spring water for drinking and domestic purposes.

The system of house sanitation is perfect. There is a house to house collection of refuse which is efficiently disposed of, and as Llandrindod is a new place and well laid out, all hotels and lodging-houses are carried on on the newest sanitary lines.

The death-rate is exceptionally low, being only 8·8 per thousand for last year.

Llandrindod is a station on the London and North-Western Railway, and is easily accessible from all parts of the kingdom. During the summer months a through carriage leaves Euston twice daily, which is of great convenience to those in charge of invalids and children.

Llangammarch Wells.

Llangammarch Wells is on the Central Wales branch of the London and North-Western Railway, midway between Shrewsbury and Swansea. It is a small village and is situated in a wide valley on the River Irvon, about 560 feet above sea level. Several houses are, however, dotted over the hillsides on heights ranging up to 700 feet or more. On the south of

the valley is the Eppyut Mountain, rising to an altitude of 1,600 feet.

The mean humidity is 79 per cent., the mean rainfall being 45·18 inches. The greatest rainfall occurs during the winter months from November to March. During this period the mean temperature is only slightly less than that of London, while during the summer months daily observation shows that the air is often several degrees cooler than that of the metropolis.

The mean minimum temperature for the past six years is 39·4°, the mean maximum being 55·6°, the mean range 16·2°, and the mean of the means 47·5°. The prevailing winds are south-west.

The mineral spring is situated about three quarters of a mile from the village, close to the Lake hotel.

The analysis is as follows, the results being expressed in grains per gallon :—

Chloride of sodium	186·200
Chloride of calcium	85·160
Chloride of magnesium	20·100
Chloride of barium	6·749
Chloride of lithium	0·847
Chloride of ammonium	0·262
Alumina and silica	3·340
Bromine or bromide	Distinct traces.
Total mineral matters	302·658.

The water is used externally in the form of reclining baths and is also taken internally, usually from one to two pints being consumed daily. It is indicated in cardiac disease, chronic rheumatism and gout, lithæmia, anæmia and scrofula.

In cases of heart disease its efficacy is probably due to the chloride of barium which it contains. The action is to slow the pulse, prolonging the diastole and increasing the force of the systole, this with an increased diuresis affords considerable relief in cases of valvular disease.

Combined with the internal administration is the action of the baths, which, although not aerated, are used in the same manner as those of Nauheim. Here a similar action on the

circulation occurs, the effect of a single bath frequently lowering the pulse-rate several beats per minute. Massage is often combined with this treatment.

Excellent results are also obtained in selected cases from hill-climbing, Llangammarch being fortunate not only in the many and varied walks and the picturesque scenery which is met at every turn, but also in the bracing atmosphere which can be felt on the hillside on the hottest days of summer.

With regard to the action of the water on uric acid, it not only increases very considerably the flow of urine, but the total output of uric acid also shows a large increment, thus affording relief in cases of renal and vesical calculus and in lithæmia generally.

The season begins in May and extends till the end of October. Accommodation at Llangammarch is somewhat limited; there are two good hotels, but the increased influx of visitors every year shows that much more accommodation is needed, especially in the shape of good boarding-houses and villas.

With regard to amusements, trout and salmon fishing may be easily obtained; there is also good shooting in the neighbourhood. A small lake has been provided in the grounds of the Lake Hotel, where boating may be obtained. There are also tennis and croquet lawns. During the season a number of concerts are held, the inhabitants of the district being specially noted for their musical talents.

Llanwrtyd Wells.

Llanwrtyd Wells, a small village in the mountains of Breconshire, is gradually coming to notice by reason of its possessing a spring of sulphuretted water which is in some ways unique, and also for the extremely bracing quality and purity of its air. The village itself is situated on either bank of the river Irfon, a tributary of the Wye, and a noted trout stream.

The station of Llanwrtyd Wells, on the London and North-

Western main line from Euston to Swansea, is five minutes' walk from the village, and the journey from Euston occupies six and a half hours.

Its elevation is 800 feet above sea-level. Situated at the entrance of the beautiful valley of Abergwessin, running to the north-west, it has immediately to the north a series of hills of an altitude of about 2,000 feet, while five miles to the south is a range called the Eppynt and to the west the Sugar Loaf. It thus lies inside the northern rim of a shallow basin. Surrounded thus by hills, its rainfall is somewhat heavy, but no record of this has been kept, nor have any other meteorological observations been made.

The soil is for the most part gravel, and it is surprising how after two or three days' rain the roads will be dry in a few hours.

Special Means of Treatment.

Mineral Springs and Baths.

(1) *Dolecoed Sulphuretted Water.*—Attfield's analysis, 1893. One gallon of this water contains :—

Total solids	81·029 grains.
Chloride of calcium	13·486 "
Chloride of sodium	60·782 "
Chloride of potassium	1·692 "
Chloride of magnesium	0·871 "
Carbonate of calcium	2·005 "
Sulphate of calcium	0·827 "
Silica	1·323 "
Lithium, barium, iron	traces.
Bromine, iodine and nitrates	traces.

And sulphuretted hydrogen in solution 10 cubic inches to the gallon. (This amount of gas is said to be half as much again since the well has been sealed.)

This water is also used for bathing purposes after being heated in a very perfect thermal apparatus in the hotel.

(2) *A Weak Chalybeate Water containing* 1·523 grains of ferrous carbonate to the gallon.

(3) *Strong Builth Water* (*saline*) brought over to the hotel from Builth daily during the season. This water resembles those of Kissengen, Homburg, and Kreuznach, and indications for its use are similar. Analysis shows it to contain :—

Total solids per gallon	1138·977	grains.
Sodium chloride	878·300	„
Lithium chloride	1·250	„
Calcium chloride	249·375	„
Magnesium chloride	6·416	„
Calcium carbonate	1·59	„
And traces of other salts.		

Victoria Wells and Baths.

In the past few years attempts have been made at various times to find other waters. Without doubt there are several sulphur springs in the neighbourhood which are made use of by the natives, but are not generally used by visitors on account of their inaccessibility. The above wells have been sunk, and three varieties of waters are said to have been found: (1) sulphurous, (2) magnesian, (3) chalybeate. Numbers of visitors drink largely of these and have great faith in their virtues. As no analysis of them is, however, up to the present forthcoming, no account of their therapeutic properties is possible.

Season.—The season may be said to last from the middle of April until the middle of October. For the better classes the preferable months are April, May, June, September and October; July and August being somewhat crowded with people from the works districts of South Wales.

Indications. (*a*) *Climatic.* The bracing quality and extreme purity of the air confer great benefits on convalescents from acute diseases, on cases of anæmia, and those "run down" from effects of town life and mental fag. If is often remarkable to see in these latter the increase of appetite, heightened sense of well-being, and ability to sleep. Cases of chronic bronchitis and bronchial asthma often do well. (*b*) *For waters or baths.* (1) Various forms of skin disease and chronic metallic poisoning; (2) gout, chronic rheumatism, osteo-arthritis; (3) chronic Bright's disease and renal calculus; certain cases of hæmaturia; (4) gall-stones and biliary gravel; (5) chronic bronchitis and bronchial asthma.

Death-rate.—12·7 per 1,000, average for past three years.

Population.—Last census, 842.

Line of Railway.—London and North-Western.

Public Water Supply.—Quality good but quantity inadequate. The principal hotel and houses on the left bank of river are supplied with an excellent water; those on the right bank are not so supplied and depend for their supply on wells. A scheme is on foot, awaiting only the sanction of the Local Government Board, for supplying the whole village. It is expected this will be completed in a year or eighteen months.

The sewage is in most cases carried direct into the river, but some houses have cess-pools. The condition of house sanitation of the principal hotel and of the best houses is very good, but that of the inferior class is primitive and leaves much to be desired.

No sanitary certificate is given, and it would be a great advantage if there were an urban sanitary authority instead of these functions being performed by the Builth Rural District Council.

Improvements.—These are all due to private enterprise. The proprietor of the Dolecoed Hotel, pump house, baths and grounds has expended on these in the past few years £30,000. Beautiful grounds have been laid out by the river, and a handsome pump house built, in which is delivered the sulphur spring. The latter flowing naturally from the rock at the rate of 4,500 gallons per diem, is enclosed in a mosaic pedestal, closed in by an hermetically sealed plate-glass disc through which the gas can be seen breaking on the surface in large bubbles. The taps are of ebonite, and the water is conveyed from the pedestal to the baths in the hotel in 3-inch ebonite pipes, and there in a therma of tinned gun metal pipes encased in cylinders of hot water it is raised to the required temperature, without the loss of a particle of gas until it pours into the baths.

Excellent as these arrangements are as far as they go, it is greatly to be regretted that the proprietor has not as yet seen his way to go further and provide douches, and skilled attendants to administer massage, Aix douche and Nauheim treatment, &c., thus largely extending the therapeutic methods

available at what, from its natural surroundings, climatic conditions, and unique water, should take a leading place among home spas. It is to be hoped a company may later be formed to carry on what is somewhat too large an undertaking for individual effort. Still, for whatever conditions simple sulphur baths are indicated, these will be found well adapted.

The Dolecoed in connection with the baths is capable of accommodating sixty persons and is a first-class hotel.

Amusements.—A fine eighteen-hole golf course, very sporting, with professional in charge, is available for visitors. There is trout-fishing and shooting reserved for hotel visitors. Numerous drives and excursions amongst scenery resembling in its grandeur that of North Wales; tennis, croquet, archery, and quoits in grounds. A lake for boating has been constructed half a mile from the village with grounds laid out for tennis, &c.

TENBY.

This Methuselah of seaside health resorts celebrated the 500th anniversary of its incorporation as a borough last year, when a handsome medal was struck to commemorate this event, jointly with the coronation of King Edward VII.

Ancient records show that at a very early period of its history the salubrious air of Tenby was sought after and enjoyed by many whose health required recuperation and whose bodies required rest. At the present day it is visited by thousands during the summer season—July to October—while in the winter months numerous families are attracted by the mild climate and moderate cost of living, to leave their country houses and reside in the town.

The climate of Tenby is insular. Three sides are washed by the sea.

The mean daily range is	11·1.
Mean humidity	82·5.
Hours of bright sunshine (average of three years) ...	7·641.

Rainfall, 1902, in inches	30·55.
Days on which the sun shone	281.
Days without rain...	191.
Highest shade temperature	77°.
Lowest shade temperature	21·8°.

The temperature of the sea in the early spring months is 50° to 53°, and in the summer from 60° to 63°.

The town is built on a rocky peninsula 100 feet above sea-level, and possesses two beautiful sandy shores, the north and the south, the latter two miles in extent. Both are excellent bathing places, the north being the safest and best.

The population is 4,412. The amusements in the summer are boating, fishing, bathing, excursions to the numerous old castles in the neighbourhood, picnics, tennis and cricket. In the winter there are balls, theatricals, concerts, hunting, and private parties. There are excellent golf links within a mile of the town available at all seasons.

Curious mineral springs are found, rising outside the church-yard wall, at Gumfreston, a small village two miles off. One of these is remarkable for the large amount of carbonic acid gas that is continually bubbling through it. Another contains iron, and might be useful in cases of anæmia.

The sanitary arrangements are quite up-to-date. The streets are swept from end to end twice a day by the town scavengers. All house refuse is removed every morning and conveyed into the country in covered carts. In the afternoon the street sweepings are removed in the same way. No pigs or ashpits are allowed. In the summer the dust is laid by water from the hydrants to which an antiseptic is added in the water-carts.

The water supply is abundant and satisfactory, and no water-borne disease has been notified for at least thirty years. Infectious diseases are very rare and never appear in epidemic form.

The climate is particularly suitable for phthisical, asthmatic and rheumatic patients.

The fauna and flora offer unlimited scope for the naturalist,

while the ancient walls and towers cannot fail to interest the archæologist and antiquarian.

Tenby is 263 miles from London and is reached *viâ* Bath and Severn Tunnel in seven and a quarter hours. There is also a convenient service from the north.

Notes and News.

We much regret to announce that it has been found necessary to abandon the tour to some of the northern health resorts, a sketch of which was given in the last issue of the Journal. The tour was to have commenced on April 25, but on the 3rd of the month not more than three people had intimated an intention to take part. As preparations were being made for our reception at most of the places which were to have been visited, it became necessary to decide whether with such small beginnings it was reasonable to expect that a sufficient number of people would attend to make these receptions other than farcical. Dr. Lunn, whose experience in such matters is unrivalled, was firmly of opinion that not more than a very few additional names would be sent in during the three weeks which remained. The localities were accordingly notified that the tour had been abandoned.

It is of course somewhat disappointing to the Council to find that their efforts to organise a scheme for the better appreciation of our home stations should meet with so little response, but they realise that there were several factors which combined to produce this effect. The time of year may have had something to say to it; the weather in April being uncertain, and the proximity to Easter of the date chosen, not being altogether convenient to many. The main deterring factor, however, seems to have been the price charged, viz., £14 14s. for a period of ten days. Having regard to the fact that the party had received the most generous offers of hospitality at all the stations (with one curious exception), such a sum certainly seemed to the organisers excessive. The matter was, however, carefully enquired into, and it transpired that the real difficulty lay with the Railway Companies, who declined to meet the wishes of the Council, backed as these were by at least one important private influence,

in the matter of prices. The two Companies in question, namely, the Midland and the Great Northern, both offered to make very substantial reductions in the ordinary tariff if the party would confine its attentions to places which either of them served, but neither would co-operate with the other in granting such reductions. When it was pointed out that the scheme as drawn out absolutely precluded the limitations which each sought to impose, both replied with a simple and emphatic *non possumus*.

WHEN this attitude of our home railways (for they are, we understand, all alike in this matter,) is compared with that of the systems both in France and Germany, it is scarcely to be wondered at that our home stations find a difficulty in competing with those on the continent. Here, no facilities at all are to be obtained for bringing our own medical men in touch with our own resorts. There, every facility is offered not only to the medical men of the nationalities in question, but so considerable are these reductions, that Dr. Lunn informs us it would be infinitely cheaper for people in this country to visit the continental spas than it is for them to become acquainted with those in this country. The tour, for example, for the Madrid Congress was only one guinea more than that to the northern spas which has now been abandoned.

THE Annual Meeting of the Society, to be held this year on May 21, will differ in several respects from former annual meetings. It has hitherto been the custom to hold a more or less informal dinner, then to repair to 20, Hanover Square to hear the annual address, which has been followed by a conversazione. This year the order has been changed, largely with the view of affording better opportunities to the Fellows of becoming acquainted with one another, which is regarded as by no means the least important function of the Society. It has accordingly been arranged that Dr. George Oliver, of Harrogate, shall deliver his address in the afternoon, imme-

diately after the General Meeting, and that the dinner shall take place at about 7.15 p.m. The details will be announced later. This order will permit of the dinner being of a character more leisurely than those to which Fellows have become accustomed, and the Council believes that the alteration will be acceptable. It is much to be hoped that there will be a good attendance at this meeting, not so much on account of the dinner, as on account of the address, which is, we understand, to embody the results of some important original work on the part of Dr. George Oliver, who has already done so much to increase our knowledge of the intricacies of blood supply and blood pressure.

A NEW monthly periodical, entitled the *Health Resort*, has made its appearance. It is addressed to the public, and seems to have for one of its objects that of popularising the many excellent stations which we have in this country. Such an object will always command the sympathy and co-operation of the Fellows of this Society, who will cordially wish success to this element at least in the new venture. The appearance of the first number is very attractive. It is well printed and artistically illustrated, and the type used is not too small. We have one criticism to make in connection with it, which refers, however, less to the management than to some of the contributors, namely, that we regret to see in it articles by members of the profession whose names, accompanied by their full styles and titles, appear in prominent type.

THIS no doubt involves a general question of ethics with regard to which it is impossible to be dogmatic. There are certain matters about which some people may feel strongly, which nevertheless when examined closely resolve themselves into matters of taste. It is, however, wise to err, if err we must, on the side of over scrupulosity, and a medical man is well advised if he lays down a rule not to write articles on professional or semi-professional matters in a lay journal under

his own name. It is only thus that he can assure himself that he is well within the letter of the unwritten law called etiquette.

THE Transatlantic style of medical literature is often dignified, but still more often perhaps it is the reverse. An instance of the former may be seen in any of the writings (and they are numerous) of Professor William Osler, whose style reflects the man. As an instance of the latter, we quote the following from a long article in a well-known American Journal: "Now, boys, what do you know about croup? What I know will bear telling. I use a good deal of the brown iodide of lime made by Billings, Clapp and Co., Boston. The calcium iodide sold in the shops ordinarily will not answer the purpose at all, but if you get the genuine preparation it will give you every satisfaction. You'll have a good many of these cases on hand this spring. Don't forget the brown iodide of lime." This has at least the merit of being arresting, and would be less objectionable were it not for the suspicion which it arouses in the English readers' mind that it is merely a clever advertisement.

WE regret to say that circumstances have conspired to prevent the appearance of any notices of books in this issue. Of those which await review we desire to call special attention to two. The one is the first volume of "A System of Clinical Medicine," by Dr. T. D. Savill (Churchill), price 12s. 6d.; the other is a work on "Refraction of the Eye," by Mr. Ernest Clarke (Baillière, Tindal and Cox), price 5s.; both of which have very conspicuous merits. We hope to deal with both in the next number of the Journal, but in the meantime we should like to say of the latter that a careful perusal of it would easily enable a practitioner with very little experience of eye work to put himself on an equality, to say the very least of it, with the opticians who airily prescribe glasses for all and sundry. The advantage to the public from a dissemina-

tion of such knowledge among members of the profession would be incalculable. The optician as a rule has a "guid conceit o' himsel'" and does not admit the existence of any higher authority. The medical man, on the other hand, where the special branches are concerned, is all too conscious of his own limitations, and readily realising where a case is beyond him, at once seeks the assistance of the learned in such matters. A study of this book will teach anyone to distinguish promptly between cases which are simple and those which are complex.

THE JOURNAL

OF

Balneology and Climatology.

VOL. VII. JULY, 1903. NO. 3.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.[1]

WEDNESDAY, MARCH 18.

ON THE DIETETIC FACTOR IN SPA TREATMENT.

BY F. A. MOUILLOT, M.D. (HARROGATE).

MR. PRESIDENT AND GENTLEMEN,—I would like in the first place to thank the Council of this Society for the compliment paid me in asking me to introduce this discussion. I am as sensible of the compliment as I am of my own inability to satisfactorily perform the task which its acceptance necessitates. I, however, feel I have been asked mainly as a representative of the important watering place at which I practise, though I would wish to make it quite clear that the opinions to which I give utterance in this paper are my own, and that my colleagues at Harrogate are in no way responsible for them.

The subject for discussion is the dietetic factor in Spa treatment. At first sight it appears a very narrow subject. but when one comes to think what it really involves you find that the greatest master in the art of condensation could not deal with it in its entirety in a fifteen minutes' paper.

The cases of chronic disease seeking relief at Spas are of

very great variety, so that the dietetic factor must vary too, and that not only with the nature of the disease but also with the constitution of the patient who has it. Then the opinion one has as to the proper dietary for each disease depends on the views you hold as to its etiology and pathology, so that the subject really involves a treatise on chronic disease as treated at Spas, with special reference to diet and the modifications, if any, required during treatment by baths and waters. This is a task, as I said before, beyond the greatest master in the useful art of condensation.

There is, however, a way out of the difficulty, and that is to confine this paper mainly to the consideration of those diseases in which diet forms an essential part of treatment, and about which there is considerable difference of opinion in our ranks, and deal lightly with those disorders in which diet is more or less an incidental factor, being generally more related to the individual than the disease and about which we are mainly in agreement.

I will, then, with your permission, confine my remarks mainly to the great trinity of diseases. Gout, obesity and glycosuria. I use the word trinity with intention, as the relation of these diseases to one another is distinctly suggestive of the Athanasian Creed. The link connecting them is that fundamentally they are caused by faulty metabolism, dependent on some defective work on the part of the liver or other gland connected with assimilation and elimination.

This class of disease forms a large proportion of the cases seen in Spa practice.

Gouty people, as we meet them in Harrogate, may be roughly divided as to their gout into three classes: (1) those who have attacks of acute gout more or less frequently; (2) those who never have had an acute attack but who suffer from lithæmic poisoning, even whilst dieting carefully, and are severely affected by gouty symptoms on comparatively slight dietetic indiscretions; (3) those who suffer little or nothing unless they eat or drink certain things, but who, to their openly expressed regret, find that they cannot live as they see other men doing.

It will usually be found that patients in classes 2 and 3 are the offspring of those who suffer from acute gout.

In a sense there is only a difference of degree between these classes, yet I find that numbers of people remain in class 2 for years and no matter what provocation they give never have an attack of acute gout. There is something more required than the circulation in the blood of the poisons produced by faulty metabolism to produce podagra, and that something is the effusion into the joints of the poison which probably only occurs when the kidney elimination is impaired or inhibited. That uric acid is by itself capable of causing all the symptoms of the gouty state I do not now believe, but I do believe that it causes some of them and that it is closely connected with the toxic material or materials which cause the others.

Recent investigations show, what many of us know to be true from practical experience, that the important thing to the patient is, not whether his food contains uric acid or not, but whether it has or has not any injurious effect upon the complicated phenomena concerned in the conversion of food stuffs into body stuffs.

The uric acid voided in the urine comes in part from nuclein contained in food and in part the nuclein produced by leucocytosis.

If that be so we must consider diet less from the point of its relation to uric acid than to its effect upon the chemistry of digestion. The chemistry of digestion is, however, so complex that we have not yet received as much guidance from its study as one would have hoped; so that the clue to the proper dietary must be found more in the results obtained by clinical experience and reasoning from analogy, than in scientific experiments. The liver normally protects the blood against the absorption of poisons from readily fermentable matter taken with food, and you can really no more test the value of a food for the gouty by its effect on the output of uric acid than you can test a drug's efficacy in the treatment of gout by the same means. For instance,

every one admits the beneficial effect of colchicum in gout, and yet its action is to diminish the amount of uric acid voided. It must produce its good effects, then, by its action on the liver and other abdominal glands, perhaps stimulating them to destroy the poison, or to get rid of it or its antecedents by the bowels. It is useless, therefore, to devote so much time to the consideration of the output of uric acid by the kidneys when you do not know what is happening to its antecedents in the liver and intestines.

Simplicity is the keynote to the dietary of gout. The meals of the present day are far too complex, too many classes and varieties of food are taken at the same meal, and the gouty man is incapable of digesting them without producing and not eliminating some deleterious products. I would lay special stress on the fact that some seem to fail through excessive production of toxic matter, and others through defective elimination. Now I find that most people can take almost any food with impunity if they take no other food at the same time, and this fact accounts for the success of diets consisting of animal food alone and vegetable food alone. Both systems agree in their simplicity. I am in the habit of saying that it is quite as great a dietetic error for some people to mix their meats as their drinks.

Any simple diet, *i.e.*, a diet of one class of food, will do good, partly because it is simple and partly because in simplicity of meals you have the greatest safeguard against excess.

Whilst admitting that occasionally one meets with a patient, generally a thin man, with defective kidneys, who does better on vegetarian diet, I hold that in the vast majority of cases the class of food which suits the gouty is animal food, meat, fish, poultry, &c., and that the class of food which disagrees most is the farinaceous class. Putting it in another way, I believe that if the patient is gouty because his elimination is defective, he does best on vegetarian diet, but if his symptoms, as is the rule, depend on overproduction of toxic material, then

he does best on animal food. The good effect of withholding all starchy food in some other kinds of auto-intoxication is well known, and no better example can be given than the splendid results of this course in the so-called gastric fever of children.

Now even a simple diet has many variations: for it would be absurd to diet a man who only now and then has gouty symptoms with that strictness which would be necessary to relieve a man whose attacks of gout were so serious and frequent as to interfere with his life's work and hasten death. The diet I recommend is one consisting in the main of meat, fish, poultry, green vegetable and some fruits. Fruit, however, should never be taken at a meat meal. In very severe cases animal food only is given for some time and then a luncheon of green vegetable and fruit allowed. The chief difficulty is to get the patients to do without bread, but by using very dry toast or torrefied bread for a time the difficulty is got over.

In the mildest cases I allow the customary mixed diet, but limit the farinaceous class and prohibit sweets and milk puddings.

Very little fluid should be taken at meal times, but the patients on this diet must take at least three tumblers of some pure soft water daily. Still Salutaris is specially suitable. Alcohol should be avoided altogether, but if that will not be conceded or is not advisable it must be restricted to meal times and be small in quantity.

The least harmful forms of alcohol seem to be whisky, still Moselle and still cider. The most injurious is champagne. No matter how "dry" this wine is, it contains some ether, which disturbs metabolism. Indeed, many patients get their first warnings of coming trouble by finding how badly champagne agrees with them. Port is an offender too, but not to the same extent as champagne. There is nothing in the dietary objectionable to any reasonable patient and I am bound to say it is generally intelligently carried out and the results have been satisfactory to the patients as well as to me.

I can imagine someone thinking that this is a fair diet for obesity in moderate degree, and that it seems a suitable way for a man to live who has glycosuria in middle age.

That is so and I believe that next to the good results of the diet that fact offers the best indication of its correctness, as these diseases are not three diseases but one disease. They are frequently present in the same individual at the same time, they occur at the same age and amongst the same classes of people. I believe that no one in large practice can possibly doubt the close connection of these three diseases, and surely if in two of them you find such a dietary as I have mentioned essential, it seems reasonable to try it in the third. Indeed, I feel convinced that except for those taking abundant exercise in the open air or doing hard manual work, the less farinaceous food taken in middle life the better.

Having now given my opinion as to what the diet of these patients ought to be in their ordinary life it remains to consider what modification (if any) Spa treatment at Harrogate entails. Is the diet to be altered in kind or restricted in quantity? The former question must be answered in the negative. If the patient is taking the proper food no alteration is necessary. There is a prejudice against taking fruit whilst drinking sulphur water, but I allow both apples and oranges, provided that they are not taken with a meat meal. I am glad to see that Dr. Blane at Aix also finds that fruit helps in the treatment of gout.

With regard to alcohol I stop it where possible altogether; but insist in all cases on its being taken only at meals and in small quantity.

In considering the question of restricting the quantity of food which a patient should take you must bear in mind the kind of life the average patient leads at Harrogate. He gets up early and takes two large tumblers of strong sulphur water before breakfast and walks about for forty minutes or so.

After breakfast his bowels are freely moved two or three times.

Then about 12 o'clock he takes magnesia water and repeats his dose about 4 o'clock. This water acts as a diuretic. In addition he has from four to six baths a week, consisting of massage, douche, or vapour baths.

He takes a good deal of exercise and lives as much as possible in the open air.

In a word, everything is done to promote metabolic activity for a period of three or more weeks. Now I ask can this be done with advantage to the patient if at the same time he is placed on a diet restricted in quantity? It can not; so that except in the case of a gross feeder, I allow my patient to take the quantity of food he has appetite for, provided he restricts himself in quality to those I order.

A few words may now be said on the diet of the obese. I believe that terrible harm is being done to this class by restricting the amount of fluid they consume. I see daily during the season the results of this course, some of them serious and painful enough. Patients of this class are often surprised and annoyed to find themselves weighing six or seven pounds more after their first week at Harrogate. This often occurs even when the girth is being obviously reduced, the reason being that the unfortunate patient has been dehydrated, and like a sponge takes in and retains the fluid he consumes until what might be called his state of liquid equilibrium has been attained.

This confusion between fat and weight is very common, and it must be wrong not to supply the tissues and secretions with the liquid they require. The close connection between gout and obesity must never be lost sight of in the treatment of the latter. If anyone doubts the possibility of the difference in the amount of fluid making so much alteration in the body weight, it is only necessary to say that I know a gentleman jockey well, who when required can reduce his weight seven pounds in a few hours by large doses of salts and by producing profuse perspiration. He rides his race, takes his ordinary food and drinks during the day and finds himself his usual weight next morning. In a minor degree the same thing occurs in any vapour bath.

Besides the confusion between weight and fat there is also a confusion between bulk and fat. For many years past I have been observing a number of patients who are bulky, and yet the substance which makes them so is not fat. The subcutaneous tissue is infiltrated with a mucoid substance over which the skin is tight, and when the skin is pinched it has a curious puckered appearance. This substance is the same I think as that present in adiposis dolorosa, and is more common than generally supposed. Diet has no effect on this condition, but thyroid extract often improves it.

It may be asked what means we have in Harrogate for providing visitors with proper dietary. In my opinion anyone requiring strict diet is better in private rooms, but the ordinary patient can get all that he and I require at any hotel. There is always a good plain breakfast, a cold luncheon and a *table d'hôte* dinner, out of which he can select a plain and substantial meal.

You will have gathered from the tone of this paper that I do not advocate the very strict measures in vogue at some of the continental health resorts, which often reduce the patient so much that an after-cure is necessary before he regains his health. No, I believe in the average case in doing the treatment quietly yet thoroughly, and educating the patient to a proper course of living, more particularly as regards the taking of non-alcoholic liquid between meals. This is a necessary concomitant to a meat dietary, whether it be for obesity, glycosuria or gout.

Quite a number of other cases come to Harrogate for treatment, which seem improved by the substitution of meat for carbohydrates, amongst which I may mention diarrhœa, alternating with constipation, dilatation of the stomach, flatulence with prominent abdomen. In anæmia, too, red meat should be given freely, and in rheumatoid arthritis abstention from carbohydrates often does good. In many skin diseases, such as urticaria, boils and some forms of eczema, which are connected with auto-intoxication, the same change in diet is advisable.

It may fairly be asked what modification does the presence of albuminuria necessitate? The answer depends on the state of the kidneys as shown by the urine. If the quantity of albumen be small and the specific gravity be 1018 or over, whilst the normal quantity of urea is being excreted, no modification is required, because the albumen itself is often caused by the same poison that produces the other symptoms, and is cured by the same means. If, however, the urine be pale in colour, of low specific gravity and deficient in urea, you have to deal with a case of deficient elimination, and must restrict the quantity of red meat. In this connection I may mention the curious fact that in gouty subjects a long railway journey often seems to bring on a temporary albuminuria. I have observed this so often that it cannot be a coincidence.

In bringing this paper to a close I will, for your convenience, state its purport in the form of seven "conclusions."

(1) That a considerable proportion of diseases treated at Spas is due to faulty metabolism, and that gout, obesity and glycosuria are the chief of these diseases and are closely connected.

(2) That gout in its widest sense is due to the development of certain poisons during the process of digestion, and that these poisons are best limited by a simple meat dietary.

(3) That it is irrational to consider food or drugs solely from the point of view of their acidity or supposed solvent power on uric acid.

(4) That if the patient is properly dieted at home no marked change ought to be made in the diet at the Spa, more particularly should the quantity of food not be restricted whilst undergoing a treatment which makes a great strain on the metabolic activity of the system.

(5) That the education which the patient receives as to the regular consumption of non-alcoholic fluid apart from meals is a useful one.

(6) That the attempt to treat obesity by withholding fluids is to be condemned, as leading to the production of

serious disease and ill-health, and that though it is right to diminish the quantity of fluid taken at meals it is wrong not to make up for that limitation by giving water apart from meals.

(7) That alcohol should be taken in very limited quantities if at all, and that for the gouty, whisky, still Moselle, and still cider seem least harmful.

In dieting an individual case the chief points I consider are the severity of the disease and the weight of the patient. The more severe the disease the stricter the diet, and the more the patient's weight is in excess the better, as a rule, he stands it. It sometimes happens that too much weight is lost, and then it becomes necessary to encourage the use of butter on some form of anti-diabetic biscuit, or give cream.

The only meat I find it necessary to forbid is pork, and the only fish, salmon and lobster.

Tea and coffee I do not find harmful if properly made and not used in excess.

Of fruits I allow apples and oranges, but forbid bananas.*

I am conscious that in this paper I have taken a very narrow line, but though Harrogate is a health resort as well as a Spa, I thought it best to limit my remarks to it in its latter capacity. This leaves it open to representatives of the health resort to speak fully upon such conditions as general debility, convalescence, &c., whilst I hope the Fellows who practise at Spas will state their views as to the diet of the gouty class.

Discussion.

Dr. Harry Campbell said: Mr. President and Gentlemen,—I have been asked to make some general remarks on the subject of diet by way of widening the scope of our discussion, and in obedience to this summons I have jotted down a few points which with your permission I will read.

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* The ideal diet for the moderately gouty man is eggs and fish for breakfast, green vegetables and fruit for lunch, and fish, meat or poultry for dinner.

I think our Society has been wise in choosing this subject for discussion. Defining the environment of an individual as the sum of the influences brought to bear upon him, we see at once what a large—what a preponderating—part of his material environment is constituted by his diet. Hence the study of dietetics is of the first importance to the physician, and yet the subject is one which, therapeutically considered, can scarcely be said to have been yet placed on a secure scientific basis. Witness the very diverse opinions held in regard to it by the members of our profession.

Some useful lessons may, I think, be learned by studying the diet of primitive man. Let us go back for a moment to the period before man cooked his food. From the time he emerged from the ape to the discovery of cooking, there can be little doubt that a long period elapsed, probably some hundreds of thousands of years. On what kind of food did he subsist all this time? We may say, unhesitatingly, that he lived chiefly by hunting and fishing, that he was, in fact, mainly carnivorous. It is a common error to suppose that in certain parts of the world the uncultivated vegetable kingdom affords, in the shape of such nutritious foods as the date, figs, banana, cocoa-nut, a supply of food sufficient for the wants of man. As a matter of fact these various articles, as we know them, are the result of centuries of careful cultivation, the wild representatives being all but inedible. Nowhere on this planet does there exist a race of men capable of subsisting entirely on uncooked, uncultivated, vegetable substances.

Other lessons are to be learned from a study of this period. Thus a little reflection will convince us that pre-cooking man must have subjected most of the vegetable food he did eat to prolonged and laborious chewing. In the case of soft, luscious fruits, *e.g.*, the blackberry, containing their saccharine constituents in the soluble, diffusible form, this was not needful; but for roots, nuts, and such like articles, in which the nutritive ingredients (starch-proteid and fats) are imprisoned in indigestible cellulose chambers, it was very necessary. There is,

so far as I know, no vegetable-feeding mammal which does not subject its vegetable food to prolonged mastication; and this not so much for facilitating the passage of the food into the stomach, as for breaking up the indigestible cellulose frame-work, and liberating the contained nutritive ingredients. It is for this purpose that the ruminant chews the cud, for even it has but limited powers of dissolving cellulose.*

It is therefore clear that so far as pre-cooking man was a vegetable feeder he must have been a very efficient masticator. Now man's supplies of starch in this period were very restricted, and inasmuch as they were thoroughly insalivated by prolonged mastication, it is clear that they were in large measure converted within the month into maltose.

We thus see that for hundreds of thousands of years man was mainly carnivorous, that he subsisted but sparingly on starch, that he was a vigorous masticator, his limited supplies of starch being largely digested within the mouth, so that his stomach and intestines were not burdened with an excess thereof.

I pass on to the next diet-epoch—which we may term the pre-agricultural cooking epoch. Several existing races belong to this epoch, and are thus available for study. The discovery of cooking was fraught with vast issues for the human race. Its importance lies in the fact that, by its means, the indigestible cellulose frame-work of vegetable substances is broken up, and the stores of imprisoned nutriment set free, to an extent which mastication, unless continued for an impracticably long time, cannot effect. Hence when man discovered the art of cookery, he multiplied many times his stores of vegetable food; and yet even with this increment, we find him still incapable of subsisting entirely on the food furnished by the uncultivated vegetable kingdom. When one comes to enquire into the diet of existing pre-agricultural peoples, one finds what one might have expected, *i.e.*, that

* The solution is effected, not by the juices yielded by the digestive glands, but through bacterial agency.

it is largely carnivorous. All of them, the Australians, the Veddahs, Bushmen, Andamanese, Negritoes, Esquimaux—depend for their sustenance largely upon the chase. And if this is true of them it must be *a fortiori* true of pre-cooking man.

This conclusion seems to me, Mr. President and Gentlemen, to be one of great importance for us physicians. It shows us that there is no justification for the assumption that animal food is necessarily poisonous to man, and that physiological salvation is to be found in a vegetarian diet alone. We cannot get away from the fact that man has evolved from the ape essentially as an animal diet. I have no brief for any school of dietetics, and merely adopt the conclusion from which there is no escape. It must not, however, be supposed that in affirming this I deny that good may often be got from curtailing the amount of animal food consumed by our patients, or even stopping animal food altogether for a time.

We next come to the agricultural epoch. The chief feature of this epoch is the enormous extent to which man has increased his supplies of saccharides. I pass by the earliest agricultural times, and come down to the present time, which dietetically considered may be termed the *age of pap*. It is characterised by the great concentration of vegetable foods, by the very small proportion of cellulosic material they contain. Thus starch and sugar, nay even vegetable proteids and fats, are nowadays consumed in the pure form, and in regard to cereal foods, which constitute such a large part of our vegetable diet, not only have the cellular portions been greatly reduced by careful cultivation, and further minimised by complex processes of milling, but they are treated so cunningly in the kitchen and the bakehouse, that when they come to the table they are for the most part soft or pappy, and make but small demand upon the function of masticating, and thus pass down into the stomach after having undergone but little digestion in the mouth. Therefore it happens that in the present age the maxillary apparatus gets very little exercise as compared with pre-historic times, and as

a result the jaws, the nasal passages and the naso-pharynx do not develop properly; neither do the tongue nor the salivary glands, nor the teeth; and the latter not being put to their proper use tend to decay, and their alveoli to become affected with pyorrhœa alveolaris.

Furthermore—and what I am about to say applies especially to children—the flooding of the stomach and intestines with large quantities of undigested starch leads to flatulent dyspepsia, a number of virulent poisons are produced; these by directly irritating the stomach and intestines set up gastritis and enteritis, the dyspepsia is now further aggravated, more poisons are formed, and there ensues in consequence a state of profound toxæmia. The entire organism thus becomes saturated with poisons, and amongst the many evils resulting from this two may be singled out, rickets and what may be termed the *catarrhal diathesis*, or increased vulnerability of the poisons, by pathogenic micro-organisms, which shows itself more especially in the tendency to inflammation and tuberculosis.

It is this catarrhal diathesis, with the resulting tendency to rhinitis and pharyngitis, coupled with the stagnation of blood and lymph in the naso-pharynx owing to the defective action of the pterygoid muscles in mastication, which in my humble opinion explain the prevalence of adenoids among moderns. I feel sure that we could practically wipe out this pest from our midst by feeding our children rationally. Leaving now these lessons to be learned from a study of man's dietary in the past, I will briefly touch upon a few further dietetic principles which appear to me to be important.

The digestibility of a substance is largely determined by its physical consistence, and all foods tend to be equally digestible when reduced to the same degree of subdivision. Pork, veal, hard-boiled eggs, lobster, cold suet-dumpling, new potatoes and new bread, owe their indigestibility to their physical, rather than to their chemical, characters. Their indigestibility essentially depends upon their tendency to pass into the stomach in solid lumps, which are not readily permeated

by the digestive juices. Making due allowance for idiosyncrasies, there are few persons, other than those acutely ill, with digestive organs so weak, that they cannot digest each and all these articles, provided they first reduce them to minute subdivisions by thorough mastication. This is especially true of starchy foods, the digestibility of which can be enormously increased by efficient mastication and insalivation. There are very few who cannot digest any starchy food you choose to offer them if they take the trouble to chew it properly. We are constantly ordering pre-digested amylaceous foods, such as Benger's food and malt extracts; these we know are readily digested by those with weak digestion. I am in the habit of telling my patients who cannot digest such foods that they can, if they will, manufacture their own malt extract in their own mouths, and to this end I advise them to eat hard crusts, Abernethy biscuits, and similar substances which invite adequate mastication. By following this plan we can quite easily cure amylaceous dyspepsia. I may here refer to the remarkable efficacy of *taka diastase* in this affection. It is far better, however, for the patient to rely upon his own diastase (= ptyalin), rather than a foreign one.

Another point I would insist upon is the great good we may do our patients by regulating the amount of food they eat. The ideal quantity is a *sufficiency*, by which I mean the minimum quantity of food consistent with the most perfect health of which the individual is capable. A quantity less than this is an *insufficient diet*, one in excess of it an *excessive diet*. If we can succeed in raising to the normal standard the diet of those who are eating too little, and reducing to the normal the diet of those who are eating too much, we shall not have lived in vain.

Here let me refer to the great importance of limiting the diet in states of dyspnœa. In this condition there is a dearth of O, and an excess of CO_2 in the blood, and the more food that is absorbed into the blood, the larger is the quantity of oxygen needed to burn it off, and the greater the quantity

of CO_2 produced, for it is one of the most remarkable facts in the physiology of nutrition that the organism, instead of refusing to absorb an excess of food, or having absorbed it simply passing it on unchanged (as may indeed sometimes happen, *e.g.*, in albuminuria or glycosuria), prefers the laborious process of katabolising all, or nearly all, the excess; for under the most favourable circumstances only a small portion of the excess is stored. Hence the greater the quantity of food that is consumed the larger is the amount of CO_2 produced, and the greater the quantity of O needed.

For these reasons we should, in cases of chronic dyspnœa, whether of pulmonary or cardiac origin, be most careful not to allow the patient to take more than a sufficiency; while in acute dyspnœa we may sometimes save life by withholding food altogether for a time.

It is especially overfed people past middle life who benefit by a reduction of diet. Here I would express the opinion that a large number of people forego much of the good they would otherwise derive from their holidays, or from visiting a health resort, by eating too much, the improved appetite resulting from the change of air and surroundings, rendering it all the more easy to err in this respect. In the case of the ill-nourished, this improvement of appetite may lead to a beneficial increase of weight, but it is by no means an unmixed blessing in the case of those who are already over-nourished. At the same time it must be acknowledged that the altered conditions of life may so improve metabolism in general, and defective metabolism in particular, as to minimise the evils resulting from the excess of the latter class. So great, indeed, may this improvement be, that the individual may under these new conditions eat and digest, and be unharmed by, articles of diet which under his customary circumstances affect him most injuriously—and this brings me to yet another dietetic principle.

In determining what diet we should prescribe in any case of disease, we should be mainly guided by the capability of the patient to digest it. We must not bother ourselves so

much about what is good or bad for the disease or what the patient can digest. With very few exceptions, *whatever food* (I care not what it is, whether it is pork, cheese, eggs, or vegetables) *can be perfectly digested, that food is good,* for I hold that a completely digestible food is acceptable to the blood in all but very exceptional cases. It is essentially because a food is not properly digested and leads to the formation of poisons by products, that it is harmful. We are beginning to see that such a disease as gout, is a toxæmia, originating essentially in the alimentary tract, and I would say of this disease as I would say of granular kidney, and other diseases which are supposed to need a special dietary, that we should not bother ourselves so much about the kind of food that is likely to suit the disease, as the kind most likely to be well digested. And here the beneficial influence of spa treatment comes in. By means of it metabolism in general and digestion in particular are modified, and an article of diet which in an individual leading a sedentary, indoor, harrassed life, acts like a poison may, under the altered conditions supplied by a health resort be digested with perfect ease.

Dr. Preston King (Bath) said: The "Dietetic Factor" at a health resort resolves itself very much into a question of diets for the invalids who visit it; and as all health resorts are famous either for their air or water, which each in turn is the cure for every disease, it must be allowed that the subject under discussion is a wide one.

At the continental Spas much more attention is given to the dietary of the visitors than is the case with us; and many of the cures that are effected are no doubt due to the overfed patients submitting for a time to some strict rules of diet, while they allow their congested organs to be thoroughly washed out and flushed by liberal libations of saline waters. Our continental friends have an advantage over us in this matter, since the Englishman abroad is a very much more docile individual than the Englishman at home, and is far more inclined to obey a foreign doctor than one of his own

countrymen. The foreigner has attempted to reduce "the cure" to an exact science, and only provides for his guests what he thinks that they should eat; while at our English health resorts—and I speak especially of Bath—we find the luxuries of the table in no way differing from those of any first-class hotel elsewhere.

Though, as I have said, the continental system has its advantages in certain forms of illness, I should be sorry to see it introduced into this country, since though it may suit some cases, there are in my experience many more for which it is unfit.

It has been said that the duty of the physician is to "generalise the disease and to individualise the patient," and in no branch of treatment does this apply more than in matters of diet. In practice then it is well to avoid all hard and fast restrictions, and to treat each case upon its merits. To do this properly we must be guided, when we see our patient first, very much by what he tells us. It is our business to sift his evidence, and analyse his experience; and so, aided by the help of his unconscious guidance, to lay down for him some general rules of diet.

No doubt many of our patients like us to be dogmatic in these matters, even to the most unimportant details, and expect to be supplied with printed lists stating what they may and may not take. If we would be honest I think that this course should be avoided, and that we should not pander to such a morbid craving for minute rules and regulations.

Human nature at best is weak, and in sickness we see it at its weakest. Our aim should be to help one patient in his weakness by giving him simple and common sense directions.

Oliver Wendell Holmes says:—

> "The patient wants of you and art,
> A track to steer by, not a finished chart."

And in order to supply this need we must begin by freeing ourselves from fanciful restrictions and the fads of fashion,

and in dietary as in other things, aim at treating not the disease but the individual who suffers.

I propose now to say a few words upon the dietary of gout and the "so-called" rheumatoid arthritis. I say the "so-called" rheumatoid arthritis, because I am bold enough to doubt whether there is such a disease at all. I mean whether what is known as rheumatoid arthritis—and there are hardly any two observers who agree as to what cases should be included under that name—really exists as a distinct and separate disease; or whether it should not rather be regarded as a condition resulting from various different infective organisms and chemical poisons. Anyway, whether this view is right or not, rheumatoid arthritis, in the widest acceptance of the term, and gout, in its more orthodox manifestations, and with its cloud of nebulous and ill-defined sequelæ, form the majority of all the cases that we see in Bath.

The directions for diet in gout, given by different authorities, are so various that if for safety the sufferer should decide to be guided by them all he would probably find himself allowed a little water—and that would have to be boiled—as his only form of nourishment. Fashion, and an unthinking observance of ancient custom, have far too great an influence in determining the dietary of gout. There is no doubt that too much animal food, especially when indulged in by a man who takes little or no exercise, tends to induce the disease; but I think that even here it is not so much the nature of the food itself as the general surroundings of the case that are to blame for the result. If meat itself were the cause, how comes it that vegetarians are liable to gout? and how about what is known as "poor man's gout"? I have seen a case of this latter kind occurring in a hard-worked, self-denying curate, who certainly did not eat too much meat, but who lived an unhygienic life of anxious work and hurried meals, and so getting below par, was reminded that, being a younger son, his only inheritance was the family gout. Heredity is, I think, the most important factor in producing the disease. Solomon must have had gout in his mind, if

he had not got it elsewhere, when he wrote, "the fathers have eaten sour grapes, and the children's teeth are set on edge." Given the heredity the disease may be kept down, not by avoiding meat or any other article of diet, if used in anything like moderation, but rather by living an active, healthy, natural life in the open air, free from the anxieties and worries which belong to the artificial surroundings of a busy town. Meat then in moderation is, I think, not contraindicated in the chronic forms of gout that visit health resorts.

Malt liquors of all kinds are supposed to be bad in gout, but I notice that, in his Gulstonian lecture of a few years ago, Dr. Luff is of opinion that the lighter ales are less gouty than even moselle or hock. Ale, like meat, may be taken if our patient can continue his outdoor exercise.

With regard to fruit much confusion of ideas seems to exist; strawberries, for instance, are by some looked upon as especially gouty, while not long ago we read in the *Lancet* about the strawberry cure for the disease.

I was lunching one day at the Club in Bath, when I overheard a gentleman at a neighbouring table saying, "it dosen't matter what you eat, or what you drink, if only you finish up your meal with a tomato," adding, "I have it from Dr. So-and-So," mentioning a local name. This is perhaps hardly worth recording, except to show to what lengths some go in their advice to gouty patients. My own opinion is that, apart from idiosyncrasies which apply equally to all forms of food, fruit may be taken by the gouty, not only without fear, but with distinct advantage.

The opinions even among the leaders of our profession upon matters of diet are, at times, remarkably diverse. I have a patient now in Bath, an elderly, gouty gentleman, who about fifteen years ago went one day to two well-known London physicians, both of whom are since dead. He told each of them that he was in the habit of eating and drinking anything that came along, and that he hunted four days a week, and shot for the rest of the time, excepting Sundays,

By one of these specialists he was told to give up eating and drinking, to take to his couch, and regard himself as a chronic invalid; by the other he was directed to go on eating and drinking as long as he could hunt. He has been going on ever since, and I hope he will still go on when he leaves Bath. Such, however, is the diversity of opinion and advice that we meet with in high places.

Sometimes it does not matter what a patient eats, or what he avoids, he will still get the gout. The late Dr. Budd of Bath is a case in point. He was a great sufferer from this disease, and he told me that dieting had practically no influence upon it whatever. At one time he was most careful in what he took, but still at regular intervals he had the acute attacks. Then he gave up dieting altogether, and found himself neither worse nor better, except that his life was at least more bearable.

Moderation should, I think, be the text for a sermon on the dietary of gout; moderation to be observed not only by the patient in what he eats and drinks, but also, and more especially, by ourselves, lest we show a too slavish adherence to authority and precedent.

"One man's meat is another man's poison" is true in nothing more than in gout; for while we see gouty patients whose personal peculiarities prevent their taking certain articles of diet, it cannot be therefore claimed that these articles make for gout.

The ideas upon the dietary of rheumatoid arthritis are in an equally unsatisfactory state. What may be called the starvation diet is far too frequently practised. In the later and more chronic forms of the disease this does little harm, but the same cannot be said in the more acute cases. I often meet in Bath with patients who have been kept on a most restricted diet, and who have been warned from taking meat as if it were a poison. I have seen and treated a good many hundred cases of rheumatoid arthritis during the last twelve years in Bath, and I can honestly say that the benefit they have derived has been due as much and sometimes more

to a liberal diet of meat, milk and eggs, with stout or some form of wine, as to our thermal waters. Rheumatoid arthritis, whether it should be looked upon as a distinct disease or not, is eminently a condition of debility, and the last thing the sufferer requires is to be further lowered by starvation.

In conclusion, I wish to say that if I have got somewhat away from the lines taken by the opener of this discussion, I can only plead in excuse the wideness of the subject. Before I sit down I want to protest once more against any tendency to generalise in matters of diet, especially among those who visit our Spas. Each case must be treated on its merits, and in our attempt to cure the disease, we must, as Mr. Malcolm Morris says, "remember that there is a man behind it."

Dr. Louis Blanc (Aix-les-Bains) thanked the members of the Society for having elected him an honorary member, an honour which he appreciated very highly, and was very proud of.

With regard to diet, he wished to speak particularly about rheumatoid arthritis, a disease seen more commonly in England than at Aix-les-Bains. Someone had taught that gout was due to extra food, but in general it came through ill-digested food; it showed that there was an altered metabolism in the body. He believed many gouty people did not know when they began to be so. They had a slight headache, perhaps also bad digestion. He agreed with the remark that gout could be caused by a kidney change, which did not permit of the elimination of toxines, the product which caused gout. It was clear, from experiments which had been made in Germany and France, as well as in England, that uric acid played a great part in the condition, and increasing the quantity of uric acid would increase the liability to gout. By decreasing the amount of uric acid gout could not be cured, but an attack could be prevented. It was interesting to find whether meat caused gout. Experiments on the subject had been made by Hermann in Germany, and by Marie in France, which showed the quantity of uric acid in the blood to be 6 per cent. in the healthy, but if a diet

consisting of large quantities of meat were given it would rise to 10 per cent. Vegetable food, on the other hand, would decrease the percentage of uric acid. If rich food with a large amount of meat caused gout, how did poor people get the condition? In the time of Louis XIV., the poor people were forced to eat grass, and yet some of them were gouty. Then it was found that some who were so starved had procured and eaten game during the night. How was the constitution to be so changed that uric acid would disappear? It had been said by one speaker that the dieting in Germany was very strict. The doctors in Aix were not so strict, because the food was not so heavy. He believed it was wrong to give toast to such patients. It was advisable to give a little animal and vegetable food mixed, but fermenting food must be excluded, such as high game. Beef should be boiled, for thus the principle which encouraged gout was taken away. Very little meat should be given. English people had bacon and eggs for breakfast, meat at lunch, and again for their late meal, but no water. That was a mistake and he believed it was the chief reason why gout was more common in England than in France. Dr. Luff had said that kidney trouble increased gout; and what was the worst thing for the kidney? Alcohol. The English drank whisky and water. A friend sent him some very good whisky, and he drank it for eighteen months, and had never before had such bad attacks of gout. If, dining at a house, an Englishman put water in his wine he would be considered stupid. Acid wine with water was very good, because much water could be put to little wine. Vichy water had been shown to have the property of decreasing the production of uric acid, and increasing the renal alkalinity. People with gout who did not consult a doctor very often took lithia water. He always ordered his gouty patients to eat plenty of fruit, the best of which were apples and strawberries. Many did not order strawberries because there was some itching of the skin, but that passed off in a day or two. But fruit should be taken fasting; he told his patients to take an apple into their bed-

room. It had been shown at the Pasteur Institute in Paris, that metals, like silver and gold, had the extraordinary power of transforming the character of cells, acting like a ferment. In Aix-les-Bains the diet for such cases was moderate, and consisted of meat, vegetable and fruit. Strawberries seemed to be the most appropriate fruit, and he thought that was because they contained a certain quantity of salicylic acid. Fruit also acted beneficially on the liver and bowels, and many people believed gout arose from the liver. By clearing the liver the feet would be kept warm and the head clear.

Dr. THEODORE SCHOTT (Nauheim) said he was sorry he did not know the paper was to be on the subject of diet, or he would have given extracts from his various papers on the choice of diet in heart disease. What he was about to say would be simply his own personal view, and he could not speak for the other fifty doctors in Nauheim. It was difficult to speak of heart disease, and the diet suitable for it, in a general way, because heart disease was connected with so many other conditions. As Dr. Blanc had said, the German doctors liked to be very strict about such matters, but they liked to be as moderate as possible. In different places in Austria and Germany general rules on the subject were given, so that people knew what was the Karlsbad diet and what was the Nauheim diet. Of course the diet was different at other places, for instance, at places for the treatment of consumption. In the case of heart disease the treatment varied very much according to whether the patient was an old or a young man, and whether the patient was obese, or one who required fattening. One of his last patients at Nauheim was very weak and had lost much flesh, and the doctor who sent him said he must be fattened as quickly as possible, and for that purpose had ordered him large quantities of bacon. The patient had stomach disease. The result was he could not bear the bacon, his disease got worse, and he became thin instead of obese.

With regard to diet in heart disease there were a few general rules which could be applied. Such a patient should

eat often, and should avoid over-distension of the stomach, as this would result in pressing the diaphragm on the lungs and heart, producing shortness of breath and weakness of heart. Over-feeding would also increase the blood pressure in the abdominal organs, and the heart had to work against that high pressure. Everything which made the heart irritable must be avoided, such as strong coffee, strong tea, strong alcohol. Effervescing waters should not be taken, but a little wine might be. The treatment of gout in people with disease of the heart varied with the climate and the habits of the people. If he ordered an English patient a little hock or moselle when it was necessary to stimulate the heart he did not bear it, because he said he got so much acidity, and therefore he had to give a little whisky and water. That might be due to custom. He would prefer that his patients drank one tablespoonful of old brandy or whisky in two pints of water in the day time, rather than that they should have two bottles of wine. It was important that patients should not drink with their meals. But obese patients might drink a little water with meals without any harm. They should eat every three hours. What may they eat? He thought soup should not be taken, because it distended the stomach. Much cabbage caused flatulence; fresh bread and fried potatoes were bad, as also were spices, and particularly pepper, for the latter irritated the kidneys, and that was very bad for the heart. He gave some very light farinaceous food, but not much. He allowed chicken, fish and a little meat. Many doctors allowed a great deal too much red meat in heart disease. He saw one patient who was required to get as fat as possible and who had been allowed to eat lobster, mayonnaise sauce and eel, with the result that he got indigestion and became worse. He made it a rule to order a good quantity of fruit, but not with meals. It did not matter much which fruits were allowed, provided they were not heavy, like bananas, and if they were eaten late at night or early in the morning. All fruits must be peeled, because the skin was heavy, and they should not be eaten with much sugar, as that

caused flatulence. But it was very important to treat patients individually, and at the same time to carefully watch them and look to their general condition. At watering places treatment was much easier than at home. The results could be more quickly arrived at, and thus not only the patients but one's medical colleagues were helped.

Dr. MAHOMED (Bournemouth) said he had listened to the discussion with great pleasure, and congratulated Dr. Mouillot on his paper, with which he thoroughly agreed. Dr. Mouillot suggested that toast should be taken instead of bread, but whichever was eaten it was the same carbohydrate diet. With regard to liquids, he had seen great benefit result in patients with gout and heart disease from reducing the quantity of fluid taken to very little indeed. He had a patient now in whom that was the only treatment which brought relief. The profession was not by any means in agreement as to the relation of uric acid to gout. He doubted whether uric acid was the sole cause of gout, and did not think the elimination of uric acid did a great deal towards curing gout. With regard to the theories advanced by some as to the elimination of urea by giving doses of salicylate of soda, apparently it was expected that great improvement would follow; but he had several times given large doses of salicylate of soda in acute attacks of gout without benefit. On the other hand he had given quinine and colchicum and produced immediate improvement. Colchicum did not increase the amount of urea passed, but rather the opposite. Its action on uric acid he believed was neutral.

Dr. Campbell's remarks about pre-cooking man were intensely interesting, but he did not think hundreds of thousands of years could have elapsed before man began to cook. No doubt man learnt to cook soon after he found out fire. In all the caves of pre-historic man, for instance, in the Neolithic age, one found calcified bones and other evidences of cooking. Man appeared on the earth, and then entirely disappeared during the glacial period.

With regard to Bournemouth, he thought people could do

with less animal food there than in inland places. For consumption less cod liver oil was given there than at other places, because patients were not able to digest it so well at Bournemouth. He always directed that the carbohydrates taken should be diminished. A small amount of red meat, with plenty of vegetables and fruits, was the most desirable diet in gouty cases.

Dr. LORIMER (Buxton) said: The subject of diet and regimen has engaged the attention of physicians since the time of Hippocrates; but since the last fifty years the researches of physiological chemistry have removed dietetics from the region of empirical observation and placed it on a more exact basis. If anyone refers to an obscure form of literature, the treatises on the actions and uses of mineral waters written 150 years ago, it will be found that physicians were then unanimous in recommending a regulated diet as a necessary accessory to the successful actions of the particular mineral spring. And such is the opinion of the present time. But it has been maintained that the dietetic system in English health resorts is obsolete, and the means for carrying it out inadequate, while in scientific accuracy and precision Continental health resorts are much in advance of our own; nay, further, it has been even said that the diet system in British health resorts is not only not conducive to recovery, but even prejudicial and antagonistic. If there should be any foundation for such accusations it is time to enquire, and, if needs be, set our house in order, by bringing the influence of this Society to bear on those whose function at a health resort is the care of the commissariat. Now, on the one hand, a special elaborate system of diet may only be for temporary use, and required on account of the therapeutic and chemical qualities of a particular mineral water, the mysteriousness of which is enhanced by a dietary singularly exceptional; and on the other hand, dieting on strictly chemical and theoretical principles does not harmonise with the results of observation and experience, and when the question is asked, what is meant by advanced and scientific dietetics? the vulgar or popular

idea is that each patient should be furnished with a diet sheet of inordinate length, with an interminable number of precepts, prohibitions, and restrictions, far surpassing in minuteness and particularity the laws of the Mosaic economy, and which begins, winds up—sometimes both—with the signature of the prescribing dietetician, whose name is the most conspicuous feature of the document. If this advanced and scientific system of dieting does not improve the health, it at least impresses the mind of those more susceptible to the influence of appearance than reality.

There are, however, special reasons why the dieting at a health resort is a matter of much importance; for apart from the question of treatment by mineral waters, where it is necessary that the dietary be regulated and adjusted so as to be compatible with them, and prevent conflicting conditions from arising, the changes of climate, altitude, and surroundings may so influence and affect the organism as to induce deviations and departures from the ordinary processes of assimilation and metabolism.

As the first effects of change of climate are generally observed on the digestive organs, a special attention to dietary may in a chronic illness form an important point for combating and conquering vicious dietetic habits, which may have become fixed in the ordinary routine of life, and may become a valuable opportunity for introducing and establishing salutary changes and reforms. For instance, there are cases where the digestive powers have become so indolent and languid with the long-continued use of predigested food as to be incapable of digesting the natural pabulum; but by the removal to a health resort an opportunity may be given of raising, by appropriate dietetic treatment, the digestive capacity to the level of digesting light but ordinary food, and no longer be dependent on reducing the food to a low standard of digestive power. Again, a system of dietetic treatment previously ineffectual, may at once become efficacious by removal to a health resort. Experience shows that under changed circumstances there may

be toleration of articles of diet which, under ordinary circumstances, would be attended with injurious results. Thus malt liquor may sometimes be taken with impunity, which under ordinary circumstances, would be immediately followed by lithuria and arthritic disturbance.

The exigencies of modern life have imposed conditions on the character of food and hours of meals which cannot be indefinitely continued without the system deteriorating, and a complete change of diet—and hours—which can most conveniently be carried out at a health resort, may nullify errors and obviate chronic departure from health. The importance of the diet factor in health resorts is obvious, but its range of application is extensive and indefinite.

The class of cases which frequents resorts for hydrotherapeutic or other treatment, is numerous and varied, and includes the gouty in its protean forms, the rheumatic, the rheumatoid arthritic, the obese, glycosuric, neurotic, faddists, and those suffering from anno domini, polyphagia, dipsomania, &c., &c. They may have been associated with previous dietetic defects, excesses, or perversions, and they may be complicated with functional disorders or organic disease of the digestive system. It is not intended to enter into the appropriate dietary for this heterogeneous group of invalids and valetudinarians, each case must be judged on its own merits and by the particular complications, and treated according to individual experience. But in regard to dietetic requirement, they may be arranged into four groups: (1) Those requiring no special dietetic regulations, who may be treated on broad general principles; if previous errors have occurred, they must be rectified. Simplicity of diet, moderation in amount, and common sense regulations effect all that is required. But this class does not constitute a majority of spa *habitués*. (2) Those cases which are complicated with digestive disorders, with obesity, glycosuria, "renal inadequacy," and *bonâ fide* idiosyncrasies in regard to articles of food. Each case must be treated according to the special condition and complications, with increase, decrease, or alteration of food, as required. (3) Under the third class

may be included cases of old age, with senile heart and vascular degeneration, and feeble digestive power (gastric atony). For this class of case—very prevalent at health resorts, expecting to live for ever—the English hotel system, with its numerous courses, excessive meat consumption, and late meals, is inapplicable and injurious. Simplicity, moderation, early meals, and a modified vegetarianism are more suitable. (4) Under the last group may be included cases of *polyphagia*, *neurotics*, with endless alleged idiosyncrasies, most of which are feigned or imaginary, and faddists; all of which imply a neurosis, some mental error, or disorder of the will. Here a diet sheet, if it has been framed according to their own wishes, becomes a subject for daily and hourly study and meditation; but the strict moral discipline of a properly conducted dietetic home offers the most likely chance of effecting reform.

Dr. LUFF thought the present subject was perhaps the most important which the Society had ever debated, because upon a proper understanding of the question of dietetics at health resorts must largely depend the future development of those resorts. As it was desirable to hear as many views from one's *confrères* at health resorts as possible, and it was impossible to finish the debate that evening, he moved the adjournment of the discussion.

Dr. ARMSTRONG seconded.

The PRESIDENT asked whether any member who could not be present at the next meeting wished to speak, and as there was no response the meeting terminated.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

WEDNESDAY, APRIL 22.

THE DIETETIC FACTOR IN HEALTH RESORT TREATMENT.

BY ARTHUR P. LUFF, M.D., B.SC., F.R.C.P. (LOND.).

I THINK it will be conceded that one of the principal objects of this Society is to bring before the members of our profession, and so indirectly before the public, the claims and advantages of the British spas and health resorts as compared with those of foreign countries.

Another object is by discussion amongst its members, and by endeavouring to bring the methods of treatment at our health resorts into line with modern methods and modern ideas, to enhance the utility and popularity of those resorts, and so to bring home to the members of our profession and to the public generally that the benefits to be obtained at the foreign spas are in equal degree obtainable at our own spas and health resorts. We wish to make it clear that, unless a complete change of environment is desired by our patients or is essential to their recovery, treatment can in the great majority of cases be carried out as effectually in our own country as abroad.

As regards balneological and climatological treatment there is little to be desired at our various spas, but in two particulars there is still room for considerable improvements, which in my opinion will do more than anything else to popularise and increase the attractiveness of our health resorts, viz., the provision of better dietetic treatment suited to the needs of the patients visiting the spas, and the infusion of greater gaiety into the daily life by the provision of more abundant amusements. It is in these two particulars that

our spas and health resorts fall short of the continental ones, and it is the comparative lack of these two conditions which induces many of our patients to go abroad. We are not dealing now with the question of amusements, and I therefore confine my remarks to the subject of this discussion.

I think that one of the main causes why insufficient attention is given to dietetic treatment at our spas and health resorts is on account of the tendency for the catering for our patients to drift more and more into the hands of Companies, whose main object is the production of large dividends, while but little attention is directed to the dietetic requirements of those they are catering for. At too many of our health resorts one sees nowadays palatial hotels, elaborately upholstered, and provided with the prolonged, many-coursed, heavy meals which are so absurdly considered by their providers to be essential to physiological necessities and to the recovery of health. I must confess that although recent experiences in London, especially in the borough in which I live, have not greatly enamoured me of municipal trading, yet I cannot help thinking that it would probably be an advantage to our spas and health resorts if the catering for the visitors were more or less under the control of the municipal authorities. Medical men would probably then be able to have their views as to the provision of suitable meals much more efficiently carried out than at present, while the cost of living at the spas would be considerably reduced.

I agree with the statement that the large majority of cases requiring dietetic treatment at spas are cases of gout, obesity, and glycosuria, to which list I would add cases of rheumatoid arthritis. As there is a general amount of accord as to the dietetic treatment of obesity and glycosuria, I shall confine my remarks to the dietetic treatment of gout and rheumatoid arthritis at spas. Gout I regard as a disease which is due to faulty metabolism, probably both intestinal and hepatic, as the result of which certain poisons (possibly the purin and other bodies, but of which we at present know but very little) are produced and lead to an auto-intoxication,

which is an early factor in the development of the gouty condition. Certainly I think that with our increasing knowledge and experience uric acid and its salts will in all probability have to be relegated to a position of subsidiary importance in the pathogenesis of gout.

As regards the question of diet it must be remembered on the one hand that animal foods constitute to the majority of people the most attractive and appetising forms of diet and are therefore likely to be taken in excess, hence the necessity for limiting the amount to be taken, but on the other hand, it must be borne in mind that in connection with life at spas, the exercise taken, the leisure permitted for digestion, and the stimulus of the baths all tend to increase the combustion and the oxidative powers within the tissues, while the large amount of water consumed tends to abundantly remove the waste products. In my opinion it is absolutely erroneous to exclude from the dietary of the day such articles as meat, fish and tea because they are assumed to contain uric acid.

I have yet to learn that any uric acid is present in those articles of diet, since the so-called estimations of uric acid in them are not, as I have previously pointed out, estimations of uric acid at all. Moreover, the deduction is an erroneous one that because uric acid is a nitrogenous body it must therefore be directly derived from nitrogenous constituents of the food, the consumption of which must therefore be avoided. Even if uric acid were present in the articles of food referred to it would not alter my opinion as to their suitability considering that they have stood the test of so prolonged a trial. Yet there are some who do not hesitate to call these articles of food, which are so extensively consumed, poisons, mainly, as far as I can gather, because these foods do not happen to agree with themselves. It is true that there are a few persons whom, without any intention of being offensive, I should describe as physiological degenerates, who find that such articles of food do not agree with them, but it is illogical to argue from such a premise

that therefore they are unsuited to the great majority whose digestive functions are more happily regulated.

The diet of gouty patients undergoing spa treatment should be simple, that is, the meals should not be made up of too many articles. Simplicity of food means facility of digestion. Certainly meat, even red meat, should not be excluded from the diet. No class of food stuff is so productive in energy as animal food, and as most cases of chronic gout are suffering from lowered vitality and want of tone, animal food in at all events moderate quantity is distinctly indicated. My experience supports the truth of this view, as I advise in the great majority of cases of chronic gout the taking of at least one meat meal a day. The exclusion of any article of diet or of any class of food without taking into account the surroundings of the case and the peculiarities of the individual is unscientific. Those articles of diet that are known in the individual to favour intestinal fermentation and putrefaction should certainly be avoided, and it may be taken, I think, as a general rule, that a sense of discomfort after a meal indicates that some article or articles of food have been taken which are not beneficial to the individual in his present condition. I attach great importance in such cases to the reduction of the starchy articles of food, but not to the total exclusion of what I believe to be the comparatively harmless potato. It is remarkable how frequently one hears from gouty patients the emphatic statement, "I never eat potatoes." I must confess that I do not know of any good and sufficient reason for this wholesale condemnation of this common article of diet. Undoubtedly amongst those gouty patients who suffer from an inability to perfectly digest starchy articles of diet—in other words, who suffer from amylaceous dyspepsia—a reduction for the time in the amount of starchy foods taken, including potatoes, is desirable; but the recognition of the existence of amylaceous dyspepsia is a fairly easy matter, and when present it can be suitably treated. Certainly those who are gouty and fat should be very sparing in the use of potatoes, as of

other carbo-hydrate forms of food. I wish, however, to protest against the too general exclusion of so common and useful an article of diet as the potato from the food of the gouty. Equally wrong, in my opinion, is the total exclusion of sugar from the dietary of all gouty individuals. Undoubtedly in certain individuals sugar may do harm, as in the cases of gouty persons who are fat, or who suffer from glycosuria, or who are prone to attacks of eczema, and in such it should be cut off; but that is no reason for the exclusion of it from the dietary of all gouty patients, especially those who are at the same time gouty and thin. I know of many gouty individuals who take sugar with absolute impunity. Some gouty subjects undoubtedly digest very badly starchy articles of diet, and in such fats may well take the place of starches. Fat bacon, properly cooked, is generally well digested by gouty individuals.

A fair proportion of vegetable food should be taken with two meals each day. The choice of vegetables will depend upon the digestive capacity of the patient, but, excepting the potato, as a rule those vegetables that grow above ground are preferable to root vegetables.

Stated as a general principle, a person who is subject to gout is better without alcohol in any form. There are, however, some who require a little alcohol, either to aid digestion or to enable them to get through their work, and here I am entirely in accord with the advice given by Goodhart, that if a man requires any stimulant at all it is a matter he must decide by experiment for himself, for no medical man can tell him. If alcohol is necessary or desirable, the form in which it is to be taken is frequently a matter which the patient can decide better than the medical man; but I would insist upon the importance of definitely limiting the amount to be taken, and of restricting its consumption absolutely to meals. Some patients find that a little whisky or brandy suits them best, others find a light still moselle preferable, while a few, but in my opinion only a very limited number, find that a light claret agrees best with them. Champagne

is a wine which is seldom suited to the gouty, especially if taken daily.

As previously stated, as little complexity as is possible in the meals is the main desideratum in the dietary of the gouty, and in a few intractable cases of chronic gout it may even become necessary to reduce the dietary for a time to the simplest possible condition, namely, to two articles of food—lean meat and water. There are a few cases of *chronic* gout which undoubtedly improve and even recover on an exclusive diet of red meat and hot water. These are generally cases of chronic gouty arthritis which have failed to yield to the ordinary methods of treatment, and which are accompanied by obstinate derangement of the gastro-intestinal tract, as evidenced by dyspepsia, flatulence, acid eructations, pyrosis, and offensive stools. I have successfully treated a few such carefully selected cases of chronic gout by the employment of this, the so-called "Salisbury" treatment; and beneficial results have also been obtained by Armstrong. It is essential before placing a patient on such diet that the urine should be carefully examined, as any advanced condition of kidney disease contra-indicates the employment of such a dietary. If the evidence of kidney derangement is only slight, the adoption of the dietary is not contra-indicated, but the urine must be carefully examined every two or three days, as any considerable increase in the albuminuria would at once be an indication for the discontinuance of this special diet. Gouty patients suffering from organic heart disease with any failure of compensation should never be placed on this dietary.

The dietary in cases of rheumatoid arthritis should be as liberal as the digestive organs allow. Any food that the patient knows from his experience agrees with him may be allowed. It is essentially a disease that requires good and nutritious feeding, and I have seen many cases of rheumatoid arthritis which have gone thoroughly to the bad through the initial error of mistaking the disease for gout, and treating it with a spare diet.

MR. WM. ARMSTRONG (Buxton) said that three factors influenced dietary in spa practice: (1) The restrictions rendered necessary by the properties of the waters of the particular resort; (2) certain general dietetic principles; (3) the special needs of the individual patient. In waters such as those of Buxton, which depended for their action mainly upon contained gases, the carbohydrates required to be reduced as much as possible; bread should be given in the "Zwieback" or twice-baked form, which possessed the double advantage of not undergoing secondary fermentation and of requiring thorough mastication and insalivation; uncooked fruits, cheese, sweets and other substances likely to set up gastric or duodenal fermentation should also be avoided. On the other hand, while going through a course of baths and waters he agreed with Dr. Mouillot that more butcher's meat could be taken than in everyday life.

Amongst dietetic principles the question of drinking with meals was a very important one. Many, especially women, take most of their daily fluid with food, with the result that the digestive process is interfered with, and the regular flushing of the stomach, liver, and kidneys is imperfectly carried out. The taking of water one hour before food relieves the natural craving of the system for fluid, making a less quantity necessary with meals, and also carries out the flushing process. Another question of importance was the complex nature of meals, foods of so many varieties requiring different digestive treatment being taken at one meal. Of course theoretically the average normal digestion should be able to deal with this task, but practically many, if not most, spa patients have a certain amount of weakness in some parts of their digestive systems. An average dinner of soup, fish, entrée, meat or poultry, sweets, savoury or cheese and dessert, with perhaps a good deal of bread and one or more forms of alcohol, would not digest nearly so easily as one of fish, meat or chicken, with a simple savoury to complete the meal.

The special study of the individual is of course all-important, for while certain general rules may be laid down each

patient and each disease have special peculiarities of their own. In gout, for instance, those patients who are too stout, and those who are too thin or ill-nourished, require modifications of dietary, as do those in whom gastric or duodenal atony is present. The dietary again would not be the same for the gouty man with good kidneys and the one with defective ones, nor in high and low arterial tension. The gouty with a *plus formation* of uric acid require quite a different line of dietetic treatment to those with a *minus excretion;* and those who go in for too much exercise can take food forbidden to the indolent.

The Salisbury diet, consisting mainly of beef and hot water, was of considerable service in certain cases of arthritis, gastric dilatation and atonic gout, with a low excretion of uric acid. The cases needed careful selection, especially in regard to the condition of the kidneys and heart. The patient should be kept under close observation, the dietary being modified as required. The purely vegetarian dietary recommended by Dr. Haig was of much value in many obstinate cases of rheumatism, and in the gouty when high arterial tension or defective kidney action were present; also in certain gouty cases with a marked plus formation of uric acid—in fact many obstinate gouty affections could be cured by a rigid adhesion to either of these two opposite dietaries, which afford an additional argument against the mixing of foods of different classes.

Mr. Armstrong, in conclusion, said he had for some years past laid great stress upon the necessity for suitable dietary in English health resorts, and was glad to find that the Balneological Society was bringing its powerful influence to bear upon the subject with what he was certain would be favourable results.

Dr. Neville Williams (Harrogate) said: This discussion is a most useful one to those who like myself practise at spas, as it gives us an opportunity of hearing the opinions of others on the question of diet, and our thanks are due to my fellow-townsman for bringing the subject to our

notice. The question so vital to an invalid—What shall I eat?—is often asked and so often answered unsatisfactorily. But I have no hesitation in saying when the question is answered satisfactorily, and when the invalid carries out rules and pays strict attention to diet, not only is recovery materially assisted but the comfort of the patient and the pleasure of his stay at the health resort are greatly enhanced. More than twenty years ago I first paid attention to the diet of the water-drinkers, for a judicious arrangement of diet is all-important to those undergoing the water cure. There were some at that time, as there are some now, who questioned the value of dietetic regulations, but I would only observe that it is absurd to say that beneficial impressions may not be made through the medium of the materia alimentaria as well as through that of the materia medica. In dealing with this question we must take a few points into consideration. First of all, we must bear in mind that we are specialists in our mode of treatment. The spa physician treats disease by special methods and places the patient under new conditions that make an unaccustomed call on his physical powers, on his muscular, nervous and lymphatic powers, and also on his power of digestion. Hence the necessity of an appropriate diet. Under his home doctor he has perhaps been taking from ½ oz. to 1 oz. of medicine three times a day. We give him from 16 ozs. to 40 ozs. before breakfast. At home he has perhaps a warm sponge bath and gentle friction with a towel. We put him in a bath of 300° of heat and upwards, and he has massage applied by two strong men. I am quoting an extreme case shewing how conditions may be modified at a spa. First then we consider the patient, his general condition and his vital powers, or the want of them. This we learn from his doctor's description of his case, from his own statement and from our personal observation. Secondly we consider the disease, whether it is likely to be benefited by a residence and treatment at the spa. Thirdly, we take into consideration the treatment or modification of treatment. When we have satisfied ourselves that he is in

a fit condition to undergo some treatment with advantage to his recovery, we order a course strong, mild, or modified suitably to his case. Fourthly, the diet. This is a most important factor in health resort treatment; but it must be borne in mind that while the diet taken at home may be suitable to the case and surroundings, it may have to be modified when taking the cure. Diet suitable to the disease, and more important still, in my judgment, diet that will agree with the waters, is necessary. If injudicious diet, that is, diet unsuitable to the waters, is given, the result is flatulency and discomfort. I have known a dish of strawberries, considered by some harmless, when drinking the waters cause a violent internal disturbance.

The primary object of diet is to maintain life, to repair waste, and to give warmth and nourishment to the tissues. Habit and climate influence in a great measure the kind and quantity of nourishment necessary. In a temperate climate a mixed diet would appear to be the most natural. The various substances, albuminous, oleaginous, saccharine, &c., must be obtained in due proportion from the animal and vegetable kingdoms.

In a health resort not only the digestibility but also the idiosyncrasy of the patient must be considered. Mutton in some acts as an irritant poison, and one case came under my notice in which arrowroot had a similar effect. No hard and fast rules can be laid down, but the diet must be modified to suit the requirements of each individual case. A lobster salad may be mentioned as almost perfect in chemical composition, containing all the ingredients necessary to nourishment, but certainly not digestible. Mutton, poultry, winged game and rice, or some farinaceous food in moderation may be taken. Fat bacon is digestible when grilled, but less so when boiled. As to the advisability of increasing the amount of fluid apart from meals, in my judgment, we should advise not the drinking of more fluid but the eating of less solid. I have ventured to make these observations on what I have found to be of benefit by experience without any pretence to a scientific arrangement.

Dr. Luff had mentioned bacon. He (Dr. Williams) had found that boiled cold bacon was indigestible, but good grilled fat bacon was not indigestible when the consumer was taking the waters. All highly-seasoned dishes and rich sauces and thick soups should be avoided. He had very strong opinions about vegetables and fruit, and generally told his patients to take no fruit because it disagreed with the water treatment, though not so much with the sulphur waters as with the iron waters. With sulphur waters the diet might be more varied than with iron ; he had nearly lost a patient who ate plums when taking iron water. He advised only roasted apple. Oranges were especially bad. A man who was crippled with muscular rheumatism, and had been in the habit of eating a large number of oranges, was under his care. He advised the man to discontinue the oranges, which was done, and though a course of the water was also taken, under advice, he had not been to him as a patient since. He attributed the improvement largely to going without oranges. He did not agree with the remarks of Dr. Luff about vegetables ; he believed the worst vegetable which could be given at a spa was one of the cabbage species ; to him a cabbage or cauliflower spelt flatulence. Another vegetable which was very bad was rhubarb, which infallibly disagreed with the waters. A little celery or asparagus could be taken, the former preferably. He believed it had been recommended in the discussion that patients should take a large quantity of fluid, but that was not his experience ; he believed people, as a rule, both ate and drank too much, and that if patients were advised to eat less instead of to drink more they would get better quicker than at present. When a patient was brought with any special complaint, such as glycosuria or albuminuria, it was necessary to be very particular about diet.

Dr. FORTESCUE FOX thought all must feel indebted to Dr. Mouillot for the admirable paper he read at the last meeting of the Society ; and having had the opportunity of looking over that paper since, he felt very much in unison with the

conclusions drawn by him. The paper marked a distinct advance in the matter of laying down the principles which should regulate dietary at spas. One or two of those general principles he wished to advert to somewhat in detail. First, as to simplicity. He thought Dr. Harry Campbell gave the Society a very good lead when he showed how far we had travelled from the simplicity of diet obtaining in the early history of mankind, and pointed out that, more especially in the case of chronic ailments, we should return to the simpler habits of our progenitors and lessen the variety of foods taken, and also their quantitiy. Dr. Campbell regarded the present as the "pap" age, and thought we should go back more to the carnivorous age; a sentiment apparently agreed with by Dr. Mouillot. Keeping in mind that simplicity, he (Dr. Fox) thought it wise to introduce some change into the dietary; the importance of other changes was fully admitted—change of scene and habit, and the giving up of pernicious practices. Dr. Mouillot had put in a somewhat strong plea for a more exclusive meat diet in many cases. He had been reminded of the admirable remark of Dr. Robert Hutchison, that the proteid of meat possessed physiological omnipotence; it was an observation which had been proved to demonstration all over the world. For instance, the Hudson Bay hunters, who had the most splendid vigour, lived on steaks and weak tea. He was glad to find that gout and allied disorders were now being looked at in a simpler and more common-sense manner and he thought the Society could take credit for having contributed to that altered view. It had been entangled for many years in the theories which had been spun in the dusty atmosphere of the laboratories, and now it was possible to view it in the bracing atmospheres of health resorts, and we found that in gout there were other elements besides the chemical one of uric acid. Much had been recently said, both at the Society and elsewhere, about giving up the traditional diets which had belonged to health resorts. It was known that all over the Continent diets had been adopted by tradition. At Karlsbad butter was anathema, while at

Vichy vegetable acids were given up, as well as wines; and it had been pointed out how unscientific such a traditional method of dieting must be. But he thought that in this country we were in danger of running to the other extreme. There was a great advantage in having some rules ready made in regard to diet at the health resorts. He had read with great interest a shrewd observer's diet, written in 1822. In connection with sulphur waters, Dr. Morrison laid it down that diet should be entirely confined to tender animal food, eggs and rice; that beef, veal, mutton, lamb, poultry, might be taken if kept till tender, but not salted meats. Hung meats were not at all admissible. No vegetables should be taken raw or boiled; rice thoroughly boiled should be the standing diet. Oatmeal should certainly be avoided. Those rules, unscientific as they might sound, had been arrived at slowly, as the result of many generations of empirical experience, and they should not be lightly set aside. The extreme to which he feared treatment was drifting in the spas could be best illustrated by a little anecdote. A friend of his came to him the other day, a very shrewd judge of human nature, and said such and such a man was taking treatment at Bath. He asked whether he (Dr. Fox) knew the doctor who was attending him, but he did not. The man said he did not think much of him, because his friend asked him what he should eat, and the doctor said it did not matter what he ate; he could eat what he was accustomed to. It happened that he had been accustomed to do most extravagant things ever day of his life, eating and drinking to his heart's content, and sometimes smoking forty cigarettes a day. That was the kind of life which it was thought could be continued during a course of mineral waters.

Dr. BUCKLEY (Buxton) said that whilst one heard much about varieties of food, but little was learned about the definite principles underlying those varieties. One recommended meat while another decried it; another recommended vegetables, but others barred them. He supposed that increased metabolism was one of the events which had to be borne in mind

in health resorts. The atmosphere usually increased the appetite, and appetite had been shown to be a great factor in digestion. That increased appetite might tempt the taking of increased food. He suggested that the diet should be simple, and if it were so it would not be appetising enough to tempt to excess in quantity. If a patient at a health resort lived in lodgings he could choose his own diet; but if he stayed at a place at which so much per day was paid, he felt that if he did not take something of each course served he was not receiving his money's worth. Dyspeptics were often benefited by residence in health resorts, but not necessarily by water-drinking or water-bathing. It was often assumed that health resorts were solely intended for drinking or bathing, forgetting the much more important factor, climate. In the matter of food he thought the principle should be that the diet taken should be, as far as knowledge permitted, limited to that amount necessary for the output of daily energy. The next important principle, which had not been much emphasised in the discussion, to which Paulo, the Russian physiologist, had lately called attention, was that the food value of any particular article of diet must depend to a large extent upon the amount of energy necessary for its digestion. For instance, chicken and pork had an equal nitrogen value in the laboratory, but pork required more energy to digest than chicken, and therefore the practical result was very different in the two cases. To his mind, the great value of the Salisbury diet lay in the same principle, and it also contained little which could set up intestinal putrefaction. The vegetarian diet which had been laid stress upon by certain extremists was amenable to the same rule. He believed a vegetarian diet called for more digestion than such a diet as the Salisbury, and a much greater quantity of vegetable must be taken to produce an equal nutritive effect; and the tax on the organs was greater, especially on the liver, whose defection was at the bottom of most of the diseases for which people came to health resorts. The question of carbohydrates was an important one. It had been suggested

that there might be a ferment in starch; but surely the most important function was that of mastication. The patient could not swallow proteids without considerable mastication, but he could eat new bread with but very little mastication, and the result in the stomach was very different. It was thus very important to look at the teeth when deciding as to diet; a particular form of food should not be ordered before seeing if the patient could deal with it properly. Again, the opinions of specialists from two different classes of health resorts, those at sulphur waters and those at indifferent waters, had been expressed. One said that fruit should not be eaten while taking iron waters, but it did not follow that the case was the same in other health resorts. Yet very little had been heard in the discussion as to the underlying principles involved.

Dr. Bowen Davies (Llandrindod Wells) said his own experience agreed with all that had been referred to that evening, and with the line taken by Dr. Mouillot in his paper. He believed the British public were impatient of restrictions in English watering places, but would take what was given them abroad without grumbling. The simplest means of limiting the food taken by persons at health resorts was to limit the number of meals, to stop the morning breakfast and afternoon tea, and take only two hearty meals a day, and nothing should be taken between meals; even the smallest amount of food would sometimes upset the stomach. Dr. Mouillot said in his paper that he recommended cider. He (Dr. Davies) had lived near a cider country for a long time, and believed cider was the most gouty drink possible. Thirty years ago, when he commenced spa treatment, he was consulted by a party of Herefordshire farmers, who were much engaged with horses, because they had been "putting their noses in the bucket too much." It appeared that the "bucket" mostly contained cider, and it was the custom to drink cider until they could do it no more, and then to go to the perry barrel until they were well. They would then return to the cider. That gave him a hint and he had followed it up since. Dry perry

was a good drink for the subjects of gout, and possibly the safest procurable. It acted as a diuretic, both at home and at spas, but no harm ensued from that. He did not see how cabbage and other crucifera could do harm ; he believed they contained something inimical to the formation of uric acid in the system. He had never been able to quite see the difference between red meat and white meat ; surely the whitest of veal was as bad as the reddest of mutton ; indeed, rather worse in his experience. The quantity of drink taken was very important, otherwise why should spas do good in gout and glycosuria ? Water was drunk at all, and he believed the merit lay in the H_2O, the only substance possessed by all spas in common.

Dr. BRAITHWAITE (Buxton) believed a great principle in diet at spas was simplicity ; and for any special disease, such as diabetes, a special diet was indicated. But the majority who lived at hotels at spas could not get that simple dietary, and it was pertinent to ask whether there was any means by which the Society could induce spa hotel managers to provide a more simple fare than at present. Also, after patients left the spa physician they should be provided with a diet table for future maintenance of health.

Dr. BLAKER said he had to plead to being what Dr. Luff had referred to as a physiological degenerate. He had been subject to gout since the age of 20, and had been obliged to live carefully. If he were to live on beef and mutton, as others did, he would be depositing uric acid within a week ; but he got along very well when eating white meats and fish and rabbit. A matter of more trouble to him was that influenza produced a terrible form of neurasthenia. Strawberries would, in him, cause asthma, and rhubarb would produce urticaria. Cider he could safely drink with moderate freedom. He thought the cider referred to by Dr. Bowen Davies was that snare and delusion to which the name " champagne cider " had been given. It had a larger proportion of mallic acid than other forms. Lobster could be taken if the tail were thrown away. He agreed that, with the exception

of the potato, vegetables which grew in the sun were of more value than those growing underground. He was much indebted for the remarks of Dr. Williams about oranges and iron waters. He had given iron to anæmic people and had wondered why it had not always suited them. The orange eating was probably the reason. There was no doubt that, in the neurotic conditions so frequently found, residence at a high altitude was of great benefit. Turkish baths were also most useful in most rheumatic and gouty conditions if the patients would take them properly. He thought two good meals a day was enough. He had a very light breakfast, a dinner at mid-day, and only Bovril and three or four Plasmon biscuits between that and his later meal. If he were proposing to dine later, he would have the Bovril and Plasmon biscuits at mid-day. He could do more work upon such a dietary than upon such an one as the customs of Society laid down.

The PRESIDENT said he simply wished to allude to one point which had not been touched upon in the discussion, namely, the special dietary required for residents in the neighbourhood of the sea. One heard a good deal about "marine cachexia" and about liver conditions developed among people residing by the sea. The last speaker and others had referred to the advantages of living above the sea-level, and one could well understand that differences of level caused a great difference in dietetic requirements. London physicians would like to have some counsel as to the diet which might wisely be adopted by patients when remaining at the seaside. It seemed constantly the case that whilst for a few weeks the marine sojourn was of advantage, after a time the vicinity to the sea called for dietetic modifications, of which he would have liked to have heard. Perhaps Dr. Snow would refer to the matter.

Dr. SNOW said it had not been his intention to join in the discussion, which had wisely been concentrated upon the spa treatment of gout and rheumatism. It was too late to enter upon a discussion on the treatment of patients by the

seaside, but it was very simple. A great deal too much had been made of seaside cachexia, from which but few people suffered. In his own town most of the people lived at a fair altitude above the sea, and there was a marked difference in the effects when living at the sea-level compared with those on higher ground back from the sea. The treatment at the seaside could be summed up in a few words—treat everything lightly, drink, tonics and food, and then people could come to the seaside without developing any cachexia.

Mr. Lee said that those who lived in London would support their friends at the spas in the attention they were inclined to devote to diet, the study of which was difficult. Theory might be used, but much depended upon experience, and spa physicians might trust to their London colleagues to enjoin strict observance of the rules laid down with regard to diet at spas, not disregard of them, as Englishmen were inclined towards.

Dr. Mouillot, in replying on the discussion, said he had been agreeably surprised during the discussion to find that almost everybody of experience at spas agreed with him in the general lines of the diet which he recommended, because a very few years ago there would have been almost as general an opinion in an entirely opposite direction. As he said in his paper, which had suffered very considerably from compression, simplicity was the main factor of all dietetic treatment of gout. He was somewhat surprised to find a gentleman saying to him privately after the last meeting that it did not matter what was eaten and drunk in gout; that if one was to be gouty one would be gouty, and diet was of no importance. If that was at all a common belief among medical men he wished to say it was not a very correct one, for the reason that though one might be gouty in a theoretical sense, and could get attacks on sufficient provocation in the way of diet, yet those attacks could be limited, and reduced from one per month to one per year, and thus much good could be done. In the course of nine or ten years of active work at a spa he had found that most patients who would give up

a complex diet and replace it by a simple one would benefit by it in the end. He was much interested and pleased with the speech of Dr. Harry Campbell, which showed how the present methods of treatment were justified by the researches into the early history of the human race. Dr. Mahomet afterwards criticised his remarks when he recommended dry toast, because he could not see what difference the dryness of the toast made; the starch was still there. The answer was given by Dr. Campbell, viz., that the person who ate very dry toast was bound to masticate it, and that process very greatly lessened the danger of subsequent indigestion. Dr. Mahomet also said he could not agree with him (Dr. Mouillot) in recommending patients to drink so much water, saying that, on the contrary, he had found many cases of cardiac trouble and others did much better when the quantities of fluid were diminished. As there were such patients as he described in the paper as dehydrated, there were also patients who were waterlogged, and if the amount of fluid taken by the waterlogged patient were limited he was obliged to take the amount of water into his blood and lymphatics. And if a patient were starved of fatty and carbonaceous food, he was obliged to make use of the fat of his body. In many instances of cardiac debility that was the case, and much good could be done by limiting the quantity of fluid taken. But in the class of case he was particularly dealing with, that which most habitually frequented the spas of the country, he was sure that even if more fluid were taken, and taken between meals rather than at meals, much good was done, and a patient was thus able to assimilate a diet which otherwise might be harmful to him. He had listened to Dr. Luff's paper with the greatest interest; that paper was the more pleasant to him because it contained his own views put into more eloquent language. That agreement was partly due to the fact that he had learnt a great deal from Dr. Luff, not only from his books and other writings, but from conversations together at various times. Dr. Luff appeared to think that if the municipal authorities would regulate the diet at watering

places much good would result; but he (Dr. Mouillot) doubted very much whether English people would allow themselves to be treated in that way at British watering places, whatever they might do abroad. But he did not really find any difficulty in that respect; his experience was that people who came to watering places for treatment were only too anxious to follow medical advice; perhaps not all their lives, but for the few weeks they were resident there. If they were told that certain foods were good for them and not others, they could select those foods and get a greater quantity than in the ordinary *table d'hôte*. With regard to payment, his own experience of London restaurants was that the more special meals one ordered the higher was the charge, and certainly higher than for the ordinary *table d'hôte*. In the club he took the ordinary *table d'hôte* dinner and ate what he wanted out of it. Dr. Bowen Davies' remarks had interested him a great deal, especially with regard to cider. In the cases alluded to he (Dr. Mouillot) thought the cider must have been taken in excessive quantities. He had taken cider himself and recommended it to many patients as a summer drink, *i.e.*, half cider and half seltzer, in small quantity, and it had agreed with all to whom he had recommended it. A good deal of difference of opinion had been expressed about the potato. He believed it became very much a question of how the potato was cooked. He could not think the ordinary boiled potato was a good form of starch, because it was not masticated, but that was not so much the case with potato cooked in a crisp form, which he preferred. While taking the sulphur waters at Harrogate he had found no difficulty with fruit, and many of his patients regularly took fruit with luncheon. He expressed his thanks to those who had participated in the discussion.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

ANNUAL MEETING, FOLLOWED BY AN ORDINARY MEETING, ON THURSDAY, MAY 21, 1903, DR. E. SYMES THOMPSON, PRESIDENT, IN THE CHAIR.

Dr. SEPTIMUS SUNDERLAND (Hon. Sec.) read the Report of the Council for the year, as follows :—

In offering to the Fellows a Report of the past session, the Council record with satisfaction that the activity of the Society, as shown by the attendance of members and the interest of the discussions, continues to increase.

Six meetings have been held at 20, Hanover Square, one of which was an afternoon meeting.

Dr. Symes Thompson, the first President elected from among the London Fellows, has fulfilled with much acceptance the varied duties of his office. He took as the subject of his presidential address, "Far-away Climates," and showed how the scope and interest of the Society might be ultimately extended, more particularly to the scattered colonies of the Empire. In the middle of the winter session Dr. Symes Thompson received the Fellows and their friends in a conversazione at his own residence, a social occasion which was much appreciated.

Papers have been read by Dr. Percy Lewis (Folkestone), on "Convalescence and Chronic Illness," and by Dr. Buckley (Buxton), on "The Local Factors Influencing Climate, with Especial Reference to Subsoil."

An interesting discussion on the "Dietetic Factor in Health Resort Treatment" was opened by Dr. Mouillot (Harrogate), and extended over two evenings.

The Council beg to thank those Fellows who have contributed papers to the meetings and to the Quarterly Journal of the Society, and who have taken part in the discussions.

The Society has lost sixteen Fellows during the year, two by death and fourteen by resignation.

It is with great regret that the Council record the loss by death of Dr. R. O. Gifford Bennett, of Buxton. He was one of the original founders of the Society, a spa physician of good repute during many years, and a Vice-President of this Society. The Council has also to record with regret the decease of Dr. Scholtz, of Cape Town.

Twenty-seven new Fellows have been elected during the year, of which number only *three* are residents in London. This fact may be regarded as a welcome indication of the interest now awakened in the work of the Society amongst medical men attached to the various health resorts.

The total number of Fellows is now about 400, being an increase of eleven over last year.

The Council have to report that in pursuance of the Laws they have nominated a Standing Committee of Referees for publications.

The question of the eligibility of foreign physicians for the Fellowship of the Society has more than once engaged their attention, and the following extract from the Minutes expresses the conclusion to which the Council has arrived on this subject: "It was decided that the Rules do not admit of the election as Ordinary Fellows of foreigners practising in foreign towns, excepting in the case of medical men practising in British Colonies. . . . The feeling was also definitely and decidedly expressed that the greatest care and discrimination should be exercised in the nomination of medical men as *Corresponding* or as *Honorary Fellows*, and that such Fellowship should be regarded as a distinction and honour to be conferred only upon a select few recommended by the Council. The Council in their decision are therefore guided by the usual significance attached to he terms "Corresponding" and "Honorary Fellows" by the Royal Medical and Chirurgical Society and the Medical Society of London, and by other well-known societies."

The projected tour under the auspices of the Society,

which was intended to include visits to a group of important English health resorts, was abandoned for the present year, mainly on account of the difficulty of arranging with the Railway Companies for the route selected. The Council confidently hope that it may be possible in future sessions to associate the Society, in one way or another, more definitely with the various localities with which our Fellows are connected.

In conclusion, the Council would remind the Fellows of the two-fold object for which our organisation was founded. Balneological and Climatological science, which it is our first aim to promote, owns no insular or political boundaries, and rests upon a wide and permanent basis. But in the second place, by ministering more and more and in various ways to the many needs and interests of the British health resorts, alike of their invalids and physicians, the Society may perform an equally important service. It is the aim and hope of the Council so to adapt and modify, wherever it may seem to be necessary, its methods and procedure as to enable the Society to fulfil the double purpose for which it was established.

Dr. BAGSHAWE, J.P., moved the adoption of the Report, and in doing so said it gave a very good record of the Society's proceedings during the past twelve months, so far as he recollected them. On one occasion the meeting was held in the afternoon, which seemed to be a good departure, and he hoped it would be repeated more than once during the coming session, as it would enable some of the members to reach home the same evening, that being impossible with evening meetings. Some extremely interesting papers had been read, especially one by Dr. Buckley, of Buxton, on the soil and other factors in regard to climate. He trusted the papers in the next session would be as good.

Dr. BOWEN DAVIES seconded, and the report was adopted.

The PRESIDENT thought Dr. Bagshawe's suggestion a valuable one in regard to afternoon meetings.

The HON. SECRETARY pointed out that the christian name

of Dr. Aubrey, Weston-super-Mare, should be Reuben on the Ballot paper.

The election of office-bearers and Council for the ensuing year was then proceeded with, and resulted in the unanimous acceptance of the list issued by the Council.

The PRESIDENT invited a discussion as to the holding of at least one of the meetings of the Society at one of the provincial watering places. He thought such a course might prove of service in the future. The country Fellows of the Society had shown such loyalty in coming to the meetings that it was thought the London Fellows might well exhibit their loyalty by visiting the provincial centres.

Dr. SNOW observed that if the Society was to be a success there must be some central place of meeting. There were very few men who cared to go away for several days in the middle of the winter. He had been thinking over the various places which might be accessible. The town selected must be within reasonable distance of London, and so that both northern and southern men could reach it conveniently. If the meeting were held at a southern watering place it would be almost inaccessible from the Northern ones. The only place he could think of which fulfilled those requirements was Bath, for that town could be reached from the South, from the West, and from the Midlands and the North. The success of any meeting in the provinces would largely depend on the accessibility of the town.

Dr. BOWEN DAVIES (Llandrindod Wells) said he believed the question before the meeting was discussed in the early days, and it was felt that there would be a much larger attendance in London than in any provincial town which might be selected. He did not think the idea of provincial meetings was a workable one. Bath had almost a monopoly of the winter season as a health resort. When that had been visited the whole possibilities were exhausted.

Dr. BAGSHAWE reminded the meeting that the Society was not only for spas, but for studying climate.

Dr. GROVES thought the Society must be satisfied if they

went to the Provinces to have one such meeting only in the year. If a Northern Spa were visited it should be sufficient if the Northern Fellows attended, and similarly in the South; but to both no doubt the London Fellows would go. As Dr. Fortescue Fox had remarked to him, Brighton did not seem to take any part in the work of the Society; and if the Society decided to visit Brighton, its Corporation would probably prove as appreciative as it had of other societies which had gone there, and the medical men there would perhaps feel that they owed something to the Society and to the community. He thought if Fellows expected those from the North to spend a few days at a Southern place, and *vice versâ* they would not be successful.

The PRESIDENT said the matter would come under the consideration of the Council, and perhaps more would be heard of it in the future. He would now ask Dr. George Oliver, F.R.C.P. (Harrogate), to read the paper which he had kindly promised. Everything which Dr. Oliver said was always of the greatest value.

Dr. GEORGE OLIVER (Harrogate) then read his paper entitled, "A Few Jottings in Physiological Medicine" (which will appear in next issue).

Dr. BURNEY YEO (London) said he was sure it was the desire of members of the Society that their very warmest thanks should be accorded to Dr. Oliver for his most interesting and valuable address, an address so scientific in its conception and so full of suggestion and practical worth. He was certain that all would look forward to the time when they would be able to study the address in print, as it was one of the most valuable contributions which the Society had ever received.

Dr. ROBERT L. BOWLES (London) said he was very happy to second the vote of thanks to Dr. Oliver for his address. He had known Dr. Oliver for some years, and he knew of his methods, having studied with him when he was in London, and knew of the advancement he was making, which had been so clearly set forth that day. He (Dr. Bowles) waited until Dr. Oliver's instrument became, as he thought,

perfect before investing in one. He then obtained one and had used it some hundreds of times, and as carefully as he could, in his daily clinical work. At last he began to feel that the instrument corrected him when he was wrong, and that it was likely to be as useful as the thermometer. It was known that the heat of the body, judged by the touch, was often deceptive, and individuals differed in the delicacy of their touch and perception. In regard to the pulse, as a person got older his delicacy of touch decreased, and he felt that his own touch did not tell him as much as it used to. After using Dr. Oliver's instrument steadily he had found that what he had considered a small, weak pulse in delicate and anæmic people, with no relative tension, was much higher than he thought. The finding out of the actual blood pressure had enabled him to be of great use to those patients. He regarded the instrument as simple, and thought its use could be easily acquired. Of course one always had doubts about a new instrument, but they all felt that Dr. Oliver would see that all care would be exercised to make the instrument perfect. He had the greatest pleasure in seconding the vote of thanks.

The vote of thanks was carried by acclamation.

The PRESIDENT, in conveying the thanks of the meeting to Dr. Oliver, said he was particularly glad Dr. Oliver had consented to contribute his observations before the Society, the Fellows of which esteemed observations giving accuracy and precision to their work—a precision which members desired earnestly to cultivate. In the hands of patient and careful men Dr. Oliver's instrument might be ranked with the ophthalmoscope in enabling one to see into the body and resolve its occult processes. By such means as those set out he believed the action of baths, of exercises, of temperature and of altitude could be traced more accurately, and also to estimate better the line of treatment from which good results could be obtained. It would enable the physician to bring to bear his methods of treatment with an amount of insight which the finger on the pulse or the ear on the chest would

not give. The observations of the author on the immense importance of physiological investigation in association with clinical work were of the greatest value. Of course it became increasingly difficult, with the specialisation of work, to carry out a high level of physiological investigation, in association with keen clinical insight, but papers like that now read would stimulate to greater accuracy in that respect.

Dr. George Oliver, in reply, expressed his great indebtedness to the Fellows of the Society for the very kind way in which they had received his somewhat imperfect production. though it was the result of a considerable amount of labour, But in work there was great pleasure, especially in work in which one was not pressed, and which could be done with care, and the results checked by all possible precautions. In that respect the last winter was one of the most pleasurable he had ever spent, though it was probably the winter in which he had worked the hardest. To that was added the extremely kind appreciation of his friends. Nothing cheered the scientific observer on his way so much as appreciation from friends, not simply pampering praise, because he felt that the words which had been spoken arose from a conviction that something had been learnt from his paper. He and his hearers were, after all, co-workers, and therefore all shared the results. He would be happy if anything he had said would stimulate others to work on similar lines, especially the younger members of the profession. He thought a young practitioner in a watering place was peculiarly well placed with regard to opportunities for scientific work. His season provided him with plenty of clinical material, and out of season he could turn his attention to physiological and pathological investigation. He would like the Society to seize that idea a little more clearly. Some of the members of the Society, especially those who had been well trained in scientific matters, could not do better than take up some subject which would reflect to some advantage on clinical work. He was convinced that the future of medicine largely depended upon pushing forward into the province of physiology; the more physiological doctors made

their work the more stable it would be. Much work yet remained to be done in many ways; for instance, the action of various medicines upon blood pressure and upon various physiological conditions; so that there was no lack of work for the younger men to take up. He thought there was no need for Dr. Bowles to speak of his own touch being less delicate than it was formerly, for he had preserved his youth wonderfully well, and he thought it was a great credit to Dr. Bowles that at his age and with his experience he should have joined in the new movement. It went to show how liberal was the spirit which actuated him.

The meeting then terminated.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

Copy of Minutes.

Ordinary Meeting held at 20, Hanover Square, on Wednesday, March 18, 1903, at 8.30 p.m. The President, Dr. Symes Thompson, in the Chair.

The following candidates were elected Fellows of the Society :—

Arthur Walter Sikes, M.D. (Lond.), M.R.C.P., F.R.C.S., London.
John English Harburn, L.R.C.P., L.R.C.S.(Ed.), Buxton.

The following candidates were nominated for election at the next ordinary meeting :—

A. G. Foljambe Forster, M.D., C.M., Cheltenham.
Ernest George Sworder, M.B., M.R.C.S., L.R.C.P., Folkestone.

Dr. Mouillot (Harrogate) introduced a discussion on "The Dietetic Factor in Health Resort Treatment."

The following speakers took part in the discussion : Drs. Harry Campbell, Preston King (Bath), Léon Blanc (Aix-les-Bains), Schott (Nauheim), Mahomed (Bournemouth), Lorimer (Buxton).

Dr. Luff proposed and Dr. Armstrong seconded the adjournment.

Ordinary Meeting, held at 20, Hanover Square, W., on Wednesday, April 22, 1903, at 8.30 p.m. The President, Dr. Symes Thompson, in the Chair.

Dr. Arthur P. Luff re-introduced the adjourned discussion on "The Dietetic Factor of Disease in Health Resort Treatment."

The following Fellows took part in the discussion : Drs. Armstrong (Buxton), Neville Williams (Harrogate), Fortescue Fox, Buckley (Buxton), Bowen Davies (Llandrindod Wells), Blaker, the President, Dr. Snow (Bournemouth).

Dr. Mouillot of Harrogate, the introducer of the discussion, then replied.

The following candidates were elected by ballot :—

A. E. Foljambe Forster, M.D., C.M.(Edin.), Cheltenham.
Ernest George Sworder, M.B., M.R.C.S., L.R.C.P., Folkestone.

The following candidates were nominated for election at the ensuing meeting :—

Geoffrey Cross, L.R.C.P., M.R.C.S., L.S.A., Ramsgate.
George Carpenter, M.D., M.R.C.P.(Lond.), London.
William Johnson Smyth, M.D.(Edin.), Bournemouth.
George R. Green, L.R.C.P., L.M., M.R.C.S., Ripon.

GENERAL Meeting, held at 20, Hanover Square, May 21, at 4.30 p.m. The President, Dr. SYMES THOMPSON, in the Chair.

The minutes of last meeting were read and confirmed.

The ballot for the Officers and Council for the ensuing session was opened, and Dr. Leon of Southsea and Dr. Lorimer of Buxton were appointed Scrutineers.

The following candidates were elected Fellows of the Society :—

Geoffrey Cross, L.R.C.P., M.R.C.S., L.S.A., Ramsgate.
George Carpenter, M.D., M.R.C.P., London.
Wm. Johnson Smyth, M.D.(Edin.), Bournemouth.
George R. Green, L.R.C.P., L.M., M.R.C.S., Ripon.

The Report of Council was read, passed and adopted.

Dr. BAGSHAWE, in moving the adoption of the Report, commented favourably on the advisability of holding some of the meetings in the afternoon.

The Scrutineers reported and the President announced that the Officers and Council recommended had been unanimously elected.

President.

Alfred Francis Street, M.A., M.D., B.C.Cantab., D.P.H., Westgate.

Vice-Presidents.

Frederic Bagshawe, M.D., F.R.C.P., J.P., St. Leonards.
G. Wm. Hamilton Cumming, M.D., M.R.C.P.Ed., Torquay.
W. Bowen Davies, M.R.C.S., L.R.C.P., J.P., Llandrindod Wells.
R. Fortescue Fox, M.D., M.R.C.P., Strathpeffer Spa, N.B.
Joseph Groves, B.A., M.B., J.P., Carisbrooke, Isle of Wight.
Edmund Hobhouse, M.D., F.R.C.P., Brighton.
Arthur Oliver Holbeche, L.R.C.P., M.R.C.S., Gt. Malvern.
Geo. Alex. Leon, M.A., M.D., D.P.H., Sidmouth.

J. Ivor Murray, M.D., F.R.S.Ed., J.P., London.
Ernest Solly, M.B., F.R.C.S., Harrogate.
Geo. Hobson Thompson, L.R.C.P., M.R.C.S., Buxton.
Leonard Williams, M.D., M.R.C.P., London.

Council.

Reuben Aubrey, L.R.C.P., L.S.A., Weston-Super-Mare.
Gilbert A. Bannatyne, M.D., M.B., C.M., Bath.
John W. Batterham, F.R.C.S., St. Leonards.
John B. Berry, M.R.C.S., L.S.A., Ramsgate.
William Bain, M.D., M.R.C.P., F.R.C.S., Harrogate.
John Braithwaite, M.D., B.S., Buxton.
Samuel D. Clippingdale, M.D., C.M., F.R.C.S., London.
Henry Habgood, M.D., L.R.C.P., Eastbourne.
W. Black Jones, M.D., D.P.H., Llangammarch Wells.
J. G. Douglas Kerr, M.B., C.M., J.P., Bath.
Preston King, B.A., M.D., M.R.C.S., Bath.
Percy G. Lewis, M.D., M.R.C.S., Folkestone.
James Little, M.D., F.R.C.P., Dublin.
Arthur P. Luff, M.D., F.R.C.P., London.
A. G. S. Mahomed, M.R.C.S., L.S.A., Bournemouth.
Henry McLure, M.D., M.Ch., London.
Leonard J. Minter, M.D., Brighton.
Leonard G. S. Molloy, M.A., M.D., Blackpool.
W. Pringle Morgan, B.A., M.B., D.P.H., Seaford.
F. A. de T. Mouillot, B.A., M.D., Harrogate.
S. T. Pruen, M.D., M.R.C.S., Cheltenham.
Douglas A. Reid, M.D., M.RC.S., Tenby.
Ernest Symes, M.R.C.S., L.R.C.P., Scarborough.
Abraham Thomas, M.B., Aberystwith.
E. Symes Thompson, M.D., F.R.C.P., London.
G. H. Ward-Humphreys, M.R.C.S., L.R.C.P., Cowes.
Charles Robert Watson, M.D., L.R.C.P., Tunbridge Wells.
F. Parkes Weber, M.D., F.R.C.P., London.
Charles Whitby, M.D., Burgess Hill.
Joseph P. B. Wills, M.D., M.R.C.S., Bexhill.

Chairman of Council.

Wm. V. Snow, M.D., F.R.C.P., Bournemouth.

Hon. Treasurer.

Harry Campbell, M.D., F.R.C.P., London.

Librarian.

Morgan Dockrell, M.A., M.D.

Hon. Secretaries.

H. Shirley-Jones, M.R.C.S., Droitwich.
Septimus Sunderland, M.D., M.R.C.P., London.

The following are also Vice-Presidents without a seat on the Council, unless specially elected :—

R. Eardley Wilmot, M.B., Leamington.
D. Edgar Flinn, F.R.C.S., M.R.C.P., Kingstown.

John Inglis, M.A., M.D., Hastings.
A. W. Orwin, M.D., London.
Frederic Bagshawe, M.D., F.R.C.P., St. Leonards-on-Sea.
W. Haldane, M.D., F.R.C.P.E., Bridge-of-Allan.
Andrew S. Myrtle, M.D., J.P., Harrogate.
William Vicary Snow, M.D., F.R.C.P., Bournemouth.
Wm. Moxon, M.D., Matlock.
John E. Ranking, M.D., F.R.C.P., Tunbridge Wells.
Thomas W. Thursfield, M.D., F.R.C.P., Leamington.
Charles Parsons, M.D., Dover.
Robert Cuffe, M.R.C.S., Woodhall Spa.
William J. Tyson, M.D., F.R.C.P., Folkestone.
George Oliver, M.D., F.R.C.P., Harrogate.
C. R. B. Keetley, F.R.C.S., London.
Henry McClure, M.D., London.
James Little, M.D., F.R.C.P., Dublin.
Morgan Dockrell, M.A., M.D., London.
Arthur P. Luff, M.D., F.R.C.P., London.
J. G. Douglas Kerr, M.B., C.M., J.P., Bath.
R. Fortescue Fox, M.D., M.R.C.P., Strathpeffer Spa.
E. Symes Thompson, M.D., F.R.C.P., London.

Dr. Geo. Oliver (Harrogate) then gave an address entitled "A Few Jottings in Physiological Medicine."

Dr. Burney Yeo proposed and Dr. Bowles seconded a vote of thanks to the Lecturer.

At 7.15 on the same evening, May 21, the Annual Dinner was held at Monico Restaurant. The Chair was taken by the President; Robert Barnes, Esq., M.D., F.R.C.S., LL.D., Edin., and T. Henry Green, Esq., M.D., F.R.C.P., were the guests of the Society.

About sixty Fellows and guests attended the dinner, which was considered to be the most successful and enjoyable held since the formation of the Society. An entertainment was given by the following gentlemen: Dr. Byrd Page (Prestidigitateur), and Messrs. Walter Grace, Franklin Clive, Alec White and Wharton Wells.

The toast list was as follows:—

"The King," proposed by the President.

"The Society," proposed by Dr. Robt. Barnes. Reply by Dr. Leonard Williams.

"The Guests," proposed by Dr. Wm. Bruce (Strathpeffer). Reply by Dr. Hawkins (Reading).

"The President," proposed by Dr. James Little (Dublin). Reply by Dr. Symes Thompson.

"The Officers and Council," proposed by Mr. Keetley. Reply by Dr. Fortescue Fox.

Obituary.

ALFRED HAVILAND, M.R.C.S.Eng., F.R.M.C.S., F.S.I., Fellow of the British Balneological and Climatological Society; late Lecturer on the Geographical Distribution of Disease at St. Thomas's Hospital, London; late Surgeon Honorary Medical Staff of the Bridgewater Infirmary; late Medical Officer of Health, Northampton Combined Districts. Author of "Climate, Weather and Disease"; "Sanitary Condition of Ancient Rome"; "The Geographical Distribution of Heart Disease, Cancer, and Phthisis in Great Britain," illustrated by coloured maps.

The death of Mr. Alfred Haviland took place at his residence, "Ridgemount," near Frimley Green, Surrey, at the age of 78, on May 30 last, after an illness of two and a half years most patiently borne, and much alleviated by the sympathy and skill of his friend and adviser, Dr. Blacker, of Farnborough. The deceased gentleman was one of the oldest members of and contributors to the Balneological and Climatological Society; in fact, he was offered the position of its first President.

Mr. Haviland was born at Bridgewater in Somersetshire, and was the only surviving son of the late Mr. James Haviland, M.R.C.S.E., J.P. He received his early education at the Hackney Church of England School. His medical curriculum was finished at the London University in 1845, and he became a partner in his father's old-established practice immediately afterwards.

In 1849 he had the medical charge of his native town at the time of the direful visitation of Asiatic cholera epidemic of that year, for two months undertaking to attend to all cholera cases, whether paupers or not, that occurred in a borough of less than 12,000 inhabitants. The epidemic lasted nearly four months (August 8 to December 1 inclusive), and during that time 208 deaths from cholera and choleraic diarrhœa were registered within the town boundaries, so that the deaths from these causes alone were equal to an annual rate of 57.7 per 1,000.

At the time of his attendance on his cholera patients he was taking meteorological observations not only at the usual regular periods, but at various times of the day and night, as regards the *winds*, and among the results he noted the following coincident facts: (1) Whenever well-established *calms* prevailed over the infected area, there was at once an increase in the number of *fresh* cases of *cholera*. (2) On the other hand, whenever the air was disturbed by equatorial currents from south to west by south-west, blowing strongly, the number of fresh cases from *cholera* was *immediately reduced.*

The year 1848 is memorable among meteorologists from the fact that Schönbein then first made known his discovery of how to detect ozone in the atmosphere by means of white blotting-paper saturated with a solution of potassium-iodide and starch. To England during 1853 these papers were brought, a corps of observers was formed, and he was among the first to join at the request of his friend the late Mr. G. J. Symons, F.R.S., and he has mentioned the deep impression some of the results of his observations made upon him, for he very soon found that the "calms" and "strong equatorial winds" which he had noted in 1849, when tested by the ozone papers, produced very different effects on it, for during "calms" the little white slip of paper would hang for days without indicating any ozone in the air by turning brown, whilst on the other hand, immediately the wind blew strongly from the southerly quarters named, it would assume a dark brown colour, and when immersed in water reveal the beautiful dark violet hue from which indigo derives its name.

In 1856, with a view to bringing before his brother medical practitioners an epitome of the observations of Hippocrates, he published his first work on "Climate, Weather and Disease,"* in which among other subjects the mortality from phthisis in relation to atmospheric temperature was considered. This led to a correspondence with the eminent French physician and medical geographer, Boudin, who shortly after published his "Géographie Médicale," based principally on the statistics of the French army. At that time Dr. Farr had not published his first supplement to the Registrar-General's reports, and therefore a medical geography for England and Wales would have been a difficult if not an impossible task.

In 1864 Dr. Farr published his first decennial supplement to the Registrar-General's Twenty-fifth Annual Report, which rendered the geographical distribution of disease in England and Wales a possibility. This supplement afterwards formed the basis of the first edition of Mr. Haviland's work on "The Geographical Distribution of Disease."

At the late Dr. Robert Druitt's request he wrote an article calling attention to the folly of hurrying to catch trains, which article was published in the *Medical Times and Gazette*, on February 22, 1868, under the heading of "Hurried to Death,"† and was reprinted in pamphlet form with considerable additions in the autumn of the same year under the same title.

It was in this reprint that Mr. Haviland first gave the results of his investigations as to the "Geographical Distribution of Heart Disease," which he had undertaken to test the soundness of the prevailing opinion that the new mode of travelling by railway was the cause of the supposed increase of that cause of death.

On consulting Dr. Farr's first supplement to the Registrar-

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* "Climate, Weather, and Disease." London: John Churchill.

† "Hurried to Death," especially addressed to Railway Travellers. (Henry Renshaw, 356, Strand, and W. Mitchell and Co., 39, Charing Cross, London.)

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General's Twenty-fifth Annual Report for the ten years 1851-1860, he tabulated the death-rate so as to enable him to devote a chapter (pp. 42-49) to "The Geographical Distributions of Heart Disease in England and Wales," in which he foreshadowed the result he first published in a paper read before the Medical Society of London. In this preliminary chapter he gave a diagram roughly showing the mortality from heart disease according to aspect throughout the country. His next attempt at illustrating the subject was by mapping out the 630 registration districts of England and Wales in colours, which work was very greatly facilitated by the kindness of the late Major Graham, the then Registrar-General, the late Dr. Farr, and Captain William Clode.

The interesting observations of Dr. Farr, Mr. Hingeston,* and others, on the significant connection between a calm state of the atmosphere and an increase in the fresh cases of cholera, and in the mortality from this cause, were anticipated by Hippocrates, who noted in his "Pestilential Constitution" that the "calms" that prevailed during times of epidemics were accompanied and succeeded by their intensification.

On November 30, 1868, Mr. Haviland read his first paper on "The Geographical Distribution of Cancer among Females throughout England and Wales during the decennial period 1851-1860," before the Medical Society of London, under the Presidency of the late Sir Benjamin Ward Richardson, M.A., M.D., F.R.S.

In 1875 he published "The Geographical Distribution of Heart Disease and Dropsy, Cancer in Females, and Phthisis in Females in England and Wales," illustrated by coloured maps (Smith Elder and Co., London).

In 1876 he published a report on an outbreak of enteric fever in Uppingham School, 1875-1876.

In 1879 he read a paper entitled "The Distribution of Disease popularly considered," for which he received the "Society of Arts" Silver Medal.

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* "Climate, Weather, and Disease," p. 128.

In 1879 he read a paper entitled "Geology in Relation to Sanitary Science" at the Croydon Congress of the Sanitary Institute; and in 1882 published "Brighton as a Health Resort."

The following year (1883) his works, "Scarborough as a Health Resort" and "Consumption in the Isle of Man," illustrated by coloured maps, came before the public.

In 1886-1887 he brought out maps and papers on "Wheat Yield," "Glaciation," and "Sunshine" in the Isle of Man.

In 1888 he brought forward his views in "Chalk *v.* Cancer" at the International Geological Congress. He also established the Manx Geological Society, of which he was the first President.

The next year (1889) the pamphlet on "The Infrequency of Cancer in the Lake District" was published.

In 1890, "The Increase of Cancer; its Probable Cause," published in the *Lancet*, vol. ii., pp. 316-318. "The Ill Effects of Floods on Health," read before the Congress of the Sanitary Institute held at Brighton.

In 1891, a paper on "The Influence of Clays and Limestones on Medical Geography, illustrated by the Geographical Distribution of Cancer among Females in England and Wales," was read before the Hygienic Congress; also "Climates, Past and Present," "Port St. Mary as a Health Resort," and various papers on the Isle of Man were written in this year.

The year 1892 saw the second edition of "The Geographical Distribution of Disease in Great Britain" (Swan Sonnenschein, London) published; the English Lake district being specially dealt with. Part I.

In 1896 a pamphlet entitled "Medical Geography as an aid to Clinical Medicine" was delivered by him at the first meeting of the Isle of Man Medical Society.

Mr. Haviland had been almost incapacitated for work since November, 1900, but prior to that period he had collected various material for Part II. of his work, which up to the last he looked forward to publishing.

Mr. Haviland came of an old Norman family, a branch of which had been settled for several generations in Somerset-

shire, whilst his mother was a lineal descendant of one of the oldest families in Devonshire—the Haydons of Cadhay.

He married a daughter (who survives him) of the late Mr. Edward Pain, of "Wykeham Park," Frimley, by his first wife, Miss Louisa Philippa Bellew, of Stockleigh Court, Devon, and leaves a son, Mr. Charles Cobleigh Haviland, and a daughter, Miss Louisa Philippa Bellew Haviland.

Notes from the Spas and Sea-side Stations.

CLACTON-ON-SEA.

Clacton-on-Sea is a bright and clean little town of about 8,000 inhabitants, situated on the East coast, in Essex, on a porous soil composed of sand and gravel, at an elevation of about 30 or 40 feet above the sea-level. It faces south-east. There are no hills or rivers, and the country in the immediate neighbourhood is exceedingly level. The town extends along the coast for about a mile.

It has several points in its favour as a health-resort: (1) A dry, bracing climate, with a maximum amount of bright sunshine, and a minimum rainfall. (2) A town in an excellent state of sanitation, everything being comparatively new and up-to-date. (3) A very cheerful place during the season, on account of the number and variety of the outdoor and indoor amusements.

The extreme freshness of the air is the first thing which strikes the passenger on stepping out of the train. As regards climate the winters are mild and the summers are not extremely hot.

The rainfall has been stated to be the lowest in England.

The total rainfall in 1900 was 18·58 inches; 1901, 14·19 inches; 1902, 17·49 inches.

The mean annual rainfall is 16·75 inches.

It has also been stated that there is more bright sunshine in Clacton during the year than elsewhere. The amount of bright sunshine during 1900 was 1,803·3 hours; 1901, 2,039 hours; 1902, 1,794·3 hours.

The mean annual amount of bright sunshine is 1878·8 hours, which is more than Folkestone. The mean temperature is 48·8° F. The mean range is 10·96°.

The season begins in May and ends in September, and the population during that period is increased to about 20,000.

There are no mineral waters or special baths, but the

sea-bathing is equal to any on the coast as regards safety and comfort, and is highly invigorating.

The death-rate for 1902 is 10·17 per thousand. The town is well drained, the sewage being carried far out to sea to the extreme east and west, well away from the place. The roads are cleansed and watered daily. House refuse is removed at frequent intervals, and carted into the country. The drinking water is pumped from land at Great Bentley about eight miles away, it is excellent in quality and ample in quantity. An analysis of the water is made once a month. The streets are lighted by gas. House sanitation is good, the building bye-laws and sanitary regulations being enforced with great strictness.

This is essentially a climate for weakly children, children with glandular enlargements, and anæmic children. Cases of whooping cough get well quickly. The extreme purity and freshness of the air ought to make it a suitable place for the out-door treatment of consumption, and one convalescent institution here has such an arrangement for a few of its own patients. Early cases of phthisis do well. The place is also suitable for convalescents and cardiac cases.

As regards amusements, golf links extend along the coast to the west of the town. There is a pier with a large concert room, in which music and entertainments are in full swing. Steamers to and from London and east coast seaside places run all the season. Pleasure yachts and boats can be hired. A band plays on the cliff and there are hosts of other entertainments. Brakes run daily to different places of interest, and the roads are excellent for bicycling. A regatta, athletic sports, aquatic sports and displays of fireworks, are among some of the events of the season.

Clacton-on-Sea is on the Great Eastern Railway, and is about an hour and three quarters from Liverpool Street, but there are special quick trains during the season.

There are an immense number of lodgings, boarding houses and hotels.

[I am indebted to the Sanitary and Meteorological Reports

of the District Council for some of the information contained in these notes.]

Deal.

Deal occupies a position on the south-east corner of England, between the North and South Forelands, facing the famous roadstead of the Downs, with the Goodwin Sands beyond, and from its situation must always have been a place of some consequence in the maritime concerns of the country.

The greater part of the town is built almost on the sea level upon soil consisting of sand and shingle on the north and east, and clay on the west, except towards Upper Deal, where the chalk formation predominates and extends through the higher grounds to Walmer and the surrounding districts.

The climate is healthy, the air being pure and bracing and by no means excessively cold in winter, though in spring and early summer the north-east winds are sometimes rather trying. The place has been described with truth as "breezy Deal." Perhaps for this reason convalescents make unusually rapid progress. The climate has also been found to be very beneficial in cases of a tuberculous nature in their incipiency.

Owing to the absence of hills the rainfall is very moderate, 21·17 inches being recorded for last year. Deal has a very fair share of sunshine.

The old portion of the town reminds one of the places on the opposite coast. The houses, though quaint, are not ancient, and can hardly be said to possess architectural interest. In the direction of Upper Deal to the south-west and Sandown to the north, there are new residential villas suitable for those seeking rest and quiet. Most of the leading hotels and boarding-houses are on the sea front, which furnishes a promenade in many respects unrivalled in extent and varying interest. From Sandown to the village of Kingsdown it extends to some four miles in length. The panorama of passing ships, or the crowd of wind-bound craft lying at anchor, sometimes

to the number of 400, relieve the outlook from all monotony. When a favourable wind arrives and the huge fleet spreads its sails and gets away together, the spectator is afforded a pageant well worth the trouble of a visit to Deal to witness.

There are many ways in which a visitor can amuse or employ himself.

The sea-bathing is excellent, though it is right to point out that at certain states of the tide the currents are very strong.

Boating and fishing are of the best. There are few watering places better supplied with first-class rowing-boats, and there are also many sailing-boats in which the visitor for a very moderate charge can enjoy a cruise in the Downs.

The promenade pier, 330 feet in length, affords every facility for both exercise and sport (fishing is allowed all the year round) to those who do not care for a closer acquaintance with the sea. There is a concert hall on the pier where very good entertainments are supplied during the season.

The excellent band of the Royal Marine Depôt plays on the sea front morning and evening.

Drives by char-à-banc can be enjoyed every day in summer to Betteshanger, St. Margaret's, Sandwich, and all the places of interest in the neighbourhood.

A public recreation ground has recently been purchased by the town, and as a place of shelter from the east wind will no doubt become a favourite resort.

There is a very well-equipped covered Rifle Range open to the public. Cricket and football clubs also offer attractions.

The Cinque Ports Golf Club have their links at Deal, on the sand-hills at the north end of the town. There is a lawn tennis club at Walmer.

Cyclists will find many of the roads very suitable for riding.

The estimated population of Deal is 10,919. The area of the parish is 1,158 acres.

The South-eastern and Chatham Railway run several trains in the day to and from London and by express to Victoria, the journey is accomplished in two hours and eighteen minutes.

The water supply is obtained from adits in the chalk, the works being situated on a hill between Upper Deal and Walmer. The quality is excellent and the supply constant. The undertaking is the property of the Municipalities of Deal and Walmer.

The drainage of the town has lately been remodelled at great cost, under the direction of Mr. Baldwin Latham. The whole of the sewage is carried by gravitation to a point outside the town, where it is pumped into a covered reservoir, whence at high water it is allowed to discharge into the sea, when by the north-easterly set of the tide it is carried away from the shore towards the North Sea.

The sanitation of the principal hotels and boarding-houses is good, certificates being given by the sanitary authority after inspection whenever warranted. The general sanitary condition of the town is rapidly improving. The town refuse is collected in covered carts by the town staff under the surveyor and removed to a field outside the town. Eventually it is used on the land.

The educational facilities, with the exception of the public elementary schools, are afforded by private enterprise, but there are evening classes on various subjects in St. George's Hall, under the direction of the Secondary Education Committee of the Town Council.

The Carter Institute, containing reading room, library and a spacious billiard room, occupies a central situation in the High Street.

ILKLEY-IN-WHARFEDALE, YORKSHIRE.

Ilkley-in-Wharfedale, known perhaps best as the Malvern of the North, takes its name from "Llecan," the British word for "a rock," and was mentioned by Ptolemy, the historian, under the name of Olecanum.

In the course of time Olecanum became Hilleclai and thence by easy steps to Ilkley, the modern spelling and pronunciation.

The Romans were remarkable judges of Health Stations for the site of their camps, and one can be sure that where they pitched their tents, there will be found the purest of air and the most healing of waters.

Ilkley, from being one of the ten strongholds of the Brigantes, became an important Roman Fortress, the foundations of which are still visible.

Old picturesque Ilkley was situated mainly in the valley on the south side of the River Wharfe (the bed of the river is 300 feet above sea-level), at the foot of Rombald Moor, which rises to the south to a height of 1,320 feet. To the north are the Middleton Woods and Moor, Beamsley Beacon, 1,340 feet, being the highest point.

Modern Ilkley is built on the slope of Rombald Moor and consists of villas, numerous hydropathic hotels, furnished houses, &c., at elevations varying from 400 to 1,000 feet above the level of the sea.

The Middleton Estate to the north of the river and facing southward is in the course of development, villa residences are now being built, and bids fair to rival Old Ilkley by reason of its sunny aspect and shelter from the north east winds.

Humidity varies, being highest in the valley and decreasing as we ascend the moorside.

The subsoil is of a mixed character, being porous in nature, as shown by the numerous springs that abound on the Ilkley side. The geological formation is millstone grit, and it is interesting to note the large amount of ozone present in the air, in connection with this formation. The subsoil on the opposite side of the river is clay, near the river bed it is sandy loam. Dr. Buckley, in his thoughtful paper to the Society, alludes to the influences of subsoil on health. Farmers in this district have observed that the hares, rabbits, grouse, sheep and song-birds, are larger and in better condition than those found on the opposite hills, where the soil is less porous.

Climate.—The air is tonic, exhilarating, light and refreshing to inhale, provocative to long and deep breathing. It is cool in summer, a refreshing breeze may always be found on

the hottest day on the moor. Compared to other health stations of the same latitude the winters are mild, owing probably to the proximity of the river and the sheltering influence of the hills. The river has only once been frozen over in my experience of fifteen years.

Average rainfall for ten years	35 inches.
Rainfall for 1901 and 1902 only 29·3 inches respectively.	
Maximum mean temperature..	55 ,,
Minimum ,, ,, ...	40 ,,
Isothermal	48 ,,
Mean annual range	14 ,,

There is at present no official record of sunshine, but from daily comparison with reports from other climatic resorts, Ilkley gets a large amount. In midwinter, however, the sun dips early behind Rombald Moor, but at such a time there is little power in the sun's rays, so little is lost.

The mineral springs are alkaline, chalybeate and "indifferent." They are not widely known and only require to be exploited to attain a reputation equal to those continental waters to which they are akin.

ANALYSIS OF SPRINGS.

Hygeia.		Ilkley Wells.		Chalybeate.	
Magnes. carb.	7·1 grs.	Sodi. sulph.	2·9 grs.	Ferri carb.	1·3 grs.
Sodium carb.	2·55 ,,	Sodi. chlor.	·5 ,,	Calcium sulph.	1·1 ,,
Calcium carb.	11·2 ,,	Calci. chlor.	·5 ,,	Alk. chlor.	1·0 ,,
Sodium sulph.	2·5 ,,	Calcium carb.	2·2 ,,	Volatile	2·0 ,,
Sodium chlor.	1·6 ,,	Free carb. ac.	6·6 ,,		
Silica ..	traces.	Silica.. ..	1·2 ,,		

Potass. nitrate 1·7 grs. per gallon.

Hygeia—a mildly alkaline water suitable in gout.

The larger hydro hotels are well-equipped with all modern balneological appliances.

The Ilkley season extends from Spring to late Autumn.

The establishments fill up also at Christmastide, at which time recreations of all kinds are provided.

The climate is most beneficial to those with tubercular tendencies, either glandular or those whose lung capacity is small or impaired by bronchitis, asthma, &c., and to convalescents and the myriad sufferers from nervous exhaustion, and all conditions where the metabolic processes are defective.

The late Professor Huxley, a marked type of the sufferer from the last two conditions, wrote under date April 28, on one of his many visits to Ilkley to recharge his nervous centres, as follows: "I have been improving wonderfully in the last few days; yesterday I walked to Bolton Abbey, the Strid, &c., and back, which is a matter of sixteen miles, without being particularly tired, though the sun was as hot as midsummer. It really seems to me that I am an impostor for running away, and I can hardly believe that I felt so ill and miserable four-and-twenty hours ago." Again, he writes: "I took a three hours' walk over the moors this morning with nothing but grouse and pee-wits for company, and it was perfectly delicious. I am beginning to forget that I have a liver. I feel better than I have for months. I eat, drink, and sleep well, I wish you would come here if only for a few days; I am sure the lovely air would set you up. *The country is lovely*."

Undoubtedly many patients with livers do better in moor air than at the seaside. Few seaside places are really bracing.

Cases of early phthisis are sent to browse on the moors amongst the heather and do well, especially those patients to whom the discipline and restraint of a sanatorium are unnecessary or intolerable.

The death-rate for several years has been only 10 per 1,000, inclusive of visitors.

The population is about 7,500.

The quality of the sanitation is demonstrated by a decreasing death-rate occurring in a rapidly increasing population.

Both children and flowering plants thrive here—the most delicate and practical test of climate and sanitation.

The public water supply is abundant and unusually pure and free from possible contamination—no trace of lead has ever been found in it.

The sewerage system is by means of filter beds, which has proved most efficient. The slope of the hills renders drainage most easy and rapid. The house sanitation is well looked after, and the refuse efficiently and quickly disposed of.

The hotels and lodging-houses are most comfortable and well appointed. The District Council gives sanitary certificates after a rigid inspection.

Amusements open to visitors are, golf, tennis, cricket, fishing, cycling and numerous drives and excursions to places of historic and natural interest. There are three golf courses. The Ilkley golf course of 18 holes is most beautifully situated, with first class sand bunkers.

The lawn tennis ground is one of the best in Yorkshire with 13 courts and croquet lawn.

The Olicana golf course is on the moor, consists of 9 sporting holes, to be played in the midst of the most invigorating air, and affords splendid views of the beautiful Wharfe Valley and far-reaching hills.

Ilkley boasts an improving town band, and possesses good libraries and an interesting and well kept museum.

Entertainments of various kinds take place during the season.

The hydros are self-contained in the way of amusements, and possess either winter gardens or large recreation rooms. They are really hotels with the additional advantage of good bathing facilities. These establishments would obtain the confidence of the medical profession in a greater degree if their many advantages were better known.

Last year Ilkley was one of the few health resorts to be favoured with a good season.

The local authorities are fully alive to the importance of developing the natural beauties of the place, and maintaining its reputation for restfulness and refreshment to the jaded town dweller or exhausted convalescent.

JERSEY.

Jersey, the largest and most important of the Channel Islands, lies in the Bay of Mont St. Michel. Geographically belonging to France it is still attached to that country in language. The Islanders are nevertheless most loyal to the British Crown.

Jersey is of oblong form of about 12 miles in length from east to west and in some places half that distance in width. It contains about 40,000 English acres, two-thirds of which may be said to be under cultivation.

The principal town in Jersey in St. Heliers, situated on the Bay of St. Aubins, with a population of 27,985 persons.

Communication is kept up with England daily by commodious steamships from the ports of Southampton and Weymouth, and maintained from Jersey to the French ports of St. Malo, Portbail and Carterets.

The flora of the island is remarkably rich, wheat is the principal grain in cultivation, but more ground is taken up with potatoes, which is the principal export.

The annual average temperature in 1901 was 51·3, the absolute minimum being 21·8 on January 7, and the absolute maximum 88·9 on July 19. The rainfall was 23 inches, in 1902 on 169 days only; while snow fell in January, February, March, November and December (twenty days in all) (Père M. Dechevress). The official returns of bright sunshine for 1901 gave Hastings, 2061·0 hours, Jersey, 2056·8, Worthing, 2017·0, Eastbourne, 1977·4, Falmouth, 1924·9, Brighton, 1896·8, Torquay, 1884·3, Ventnor, 1869·4, Scilly, 1859·8, Guernsey, 1852·5.

Though the climate is so mild that some at first find it relaxing, yet the purity of the air offers compensating advantages. The long late autumns are, too, much appreciated by all residents. The special feature is of course the equability of the temperature, for the thermometer neither falls very low in the winter nor rises unduly high in the summer, as in so many of the Continental resorts.

Anæmic and consumptive patients do very well here and it is also well suited for neurasthenics and people run down with overwork. Is an unusually healthy place for young children and old people.

There is no special means of treatment. There are good sands. The drainage of the town is now fairly good. Refuse is efficiently disposed of in a destructor just outside the town.

There is an excellent water supply from the reservoirs at St. Laurence, supplied by the Jersey Waterworks Co.

Jersey is a very bright and cheerful place to live in, there are plenty of amusements at hand, a good club (Victoria), excellent golf links at Gorey and St. Brelade's. Military bands play in the public parks. Plenty of sea-bathing at La Collette. Havre de Pas and in St. Aubin's Bay. Two lines of railways, eastwards to Gorey and westwards to Corbière.

The entire absence of bovine tuberculosis in the island cannot be overrated from many points of view.

Notes and News.

The Voyages d'Etudes Medicales.

The agreeable relations now happily subsisting between France and Great Britain renders the task of once more calling attention to the efforts which are being made in the former country to popularise their mineral water stations an especially pleasant one. The district selected for this year's tour is the south-eastern, and the stations to be visited include, among others, the following: Salies-du-Salat, Aulus, Ussat, Ax-les-Thermes, Les Escaldes, Font-Romeu, Mont-Louis, Carcanières, Alet, Molitg, Le Vernet, Amélie-les-Bains, Prats-de-Mollo, La Preste, Le Boulou, Banyuls-sur-Mer, Lamalou, Montmirail, Vals, Le Mont Pilat.

The "rendezvous" is at Toulouse on September 10, and the "dislocation" at Lyons on September 23. The price, which includes first-class travelling, hotel accommodation, hire of carriages — everything, in fact, which is not strictly individual or private — is 350 francs, or £14 11s. 8d. In addition, a ticket at half price is sent to each "adherent" from the point at which he enters French territory to the rendezvous, and a ticket from Lyons to the point at which he desires to leave the country.

VERY pleasant recollections of two such voyages enable us thoroughly to recommend this one to our readers as a delightful, highly edifying, and by no means expensive means of spending a holiday. The courtesy and politeness of the French are proverbial, they always appear to the best advantage under the circumstances, occasionally a little trying and fatiguing, of these trips. The latest day for "enrolling" is August 25, and all letters should reach Dr. Carron de la Carrière, 2, Rue Lincoln, Paris, before that date.

IN connection with the watering places in the Pyrenees, some of which are included in this year's tour, we gladly call attention to a small volume, entitled, "On the Choice of a Sulphur Water Spa in the French Pyrenees," by Dr. Henri Lamarque, which has just appeared. It is a charming little book, written in very easy French, and deals not only with the subject of the title, but with many of the problems of general balneology. It is published by J. B. Baillière et fils, 19, Rue Hauteville, Paris, and the price is 2 fr. 50 c.

WE deeply regret to announce that, just as we are going to press, we have received the news of the death of Dr. Watson, of Tunbridge Wells, a much valued Fellow and Member of Council of the Society.

THE JOURNAL
OF
Balneology and Climatology.

VOL. VII. OCTOBER, 1903. NO. 4.

Original Communications.

A FEW JOTTINGS IN PHYSIOLOGICAL MEDICINE.

BY GEORGE OLIVER, M.D., F.R.C.P.(HARROGATE.)

MR. PRESIDENT AND GENTLEMEN,—Two years ago it was intimated to me that this Society wished to do me the honour of calling me to its presidential chair. Inasmuch as circumstances prevented me from accepting that honour, I have since been haunted by a desire to indicate in some way my appreciation of your goodness to me, consequently I have been casting about for some suitable avenue in which to express it. Therefore, I gladly embrace the present opportunity of addressing you—an opportunity for which I am indebted to you, Mr. President, and to the Council of the Society.

The physician practising at a health resort may be regarded as a specialist in chronic ailments; for by far the larger number of his patients have been out of health for periods of varying length. Now chronic ailments are generally the outcome of some long operating cause or causes—hereditary or individual—and the material which they furnish for his daily thought and work induces the physician to cultivate a trustful study of, and reliance on, physiology as the guiding star of his practice. He endeavours to make his knowledge of physiology a living power in his daily work; he therefore adopts as far as possible methods of physiological

observation in gauging and treating pathological deviations from the normal. He is alert to turn to practical ends the results of laboratory work which are apt to remain sterile; and thus he endeavours to enrich the practice of his art. In a word, his aim is to become a practical physiologist, and something more. But we all know how difficult it is to attain to such a high ideal as this; for the exigencies of professional life tend rather to disintegrate the scientific spirit and to afford a somewhat insecure footing to the exact methods of science. As, however, medicine is moving forwards, she is happily adopting a closer walk with physiology; and her votaries are growing keen to appropriate any bit of physiological lore that may first be tested as a working fact, and which, when proved to be a truth, will in due time be deftly fitted into the future edifice of physiological medicine. One of the far-reaching branches of physiology which has of late years been pressed into the service of medicine is the study of blood-pressure and of the distribution of the blood. I propose to glance at a few sections of this interesting chapter of physiological medicine which have more particularly engaged my attention during the past year or two, and which may be of interest to some of you as practitioners in balneology and climatology. But in submitting my jottings to your consideration, I must crave your indulgence in allowing me to draw exclusively on the data which I have myself collected; and if I refer but sparingly to the work of others, it is not because I do not duly appreciate it. We are all fellow-workers in the good cause of endeavouring to advance our efficiency as practitioners of the healing art, and it is the duty of each one to contribute his mite to the common store.

Normal Blood-pressure.

The first requisite for the clinical study of blood-pressure is a knowledge of the normal blood-pressure; for that is, of course, the standard to which clinical deviations should be referred. It is well recognised that in healthy subjects it is

liable to very appreciable variations above and below a certain mean, and these extremes of normal fluctuation should be familiar to the practitioner. They are due to such physiological conditions as the ingestion of food, exercise and temperature. I have taken the opportunity afforded by the past winter's rest from clinical work, to study afresh these normal fluctuations of the circulation; and I will now sketch an outline of the results. It may appear to you to be somewhat of a reversion now-a-days to re-examine some of the elementary facts in our studies of blood-pressure; but I think you will agree with me that the best possible assurance we can have of our advancing securely in a somewhat untrodden field like this, is to retrace our steps occasionally and to re-test the safety and soundness of the track. In so doing we may verify or correct our position, and we may perchance pick up a few fragments of truth which before we passed by unheeded.

For the most part, the observations on the arterial pressure were made with the hæmodynamometer; but Hill and Barnard's sphygmometer and Gärtner's tonometer were likewise occasionally used.

I have elsewhere* shown how delicate readings of the arterial pressure may be read for physiological purposes by the blood-pressure gauge. A small artery (like the superficialis volæ) is selected, and the pulsation of the indicator is gradually developed — by gently increasing the pressure on the water pad—to its maximum degree, when the reading should be made; it will then be found that beyond this point the motion at once diminishes. With a little practice differences of even 1 or 2 mm. Hg. may be reliably read. I have found it useful to use rubber covers,† which can be placed over the pad so that the motion of the radial pulsation can be limited to a similar minimum range. This arrangement makes the reading of the arterial pressure taken from the

* See "Blood and Blood-pressure," 1901.

† Made by Mr. Hawksley, 357, Oxford Street, London, W.

radial artery more precise, and prevents a secondary rebound of the indicator, apt to be produced in some cases when a high pressure is applied to the pad, which may lead an observer to infer that the arterial pressure is higher than it is.

The Influence of Digestion on the Circulation.

During the past winter I have been much interested in the effects which the ingestion of food produces on the circulation. I had previously worked on this subject, and the results of the observations then made, and published in 1901, were confirmed; but this more thorough and more critical inquiry has revealed an extension of these results. It has shown that the ingestion of food initiates a most interesting

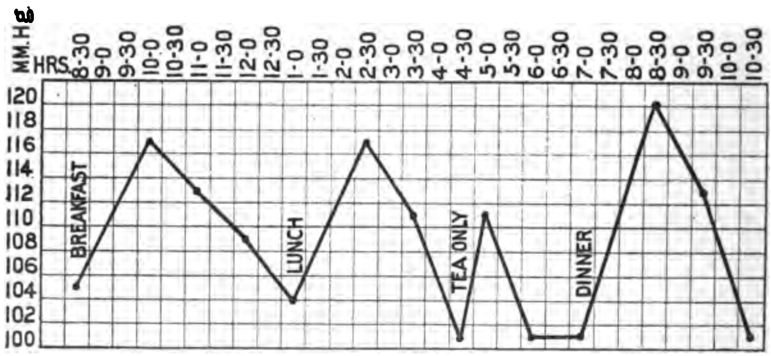

Fig. 1.—Hourly Observations of Mean Arterial Pressure.

series of circulatory events which recur with perfect regularity after every meal. The observations have proved that the influence exerted by the act of digestion on the circulation is not a mere transitory one, which may pass away, for example, within half an hour or so after a meal—it is a much more prolonged physiological disturbance, which can be traced for fully three or four hours.

I will first describe the effect of digestion on the arterial pressure, then on the capillary and venous pressures.

In fig. 1 are recorded hourly observations on the mean arterial pressure throughout the day from 8.30 a.m. to 10.30 p.m., in a subject leading an ordinary quiescent life with com-

parative rest of the muscles. You observe that the pressure follows a rhythmical course, that there is a marked rise immediately after each meal, which attains its maximum development in an hour, and then the pressure slowly subsides. This wave-like rise and fall of the arterial pressure produced by each meal lasts from two and a half to four hours. I have observed that the amplitude and length of the curve are, as a rule, proportionate to the size of the meal. The observations show that the average maximum rise of the mean arterial pressure attained in an hour after a meal amounts to 15 mm. Hg., though it may reach 20 mm. Hg.; for example, a typically normal blood-pressure wave should rise from 100 to 115, and then gradually return to 100 mm. Hg.

Now you will naturally ask, why should we have a rise in the arterial pressure after meals, when dilatation of the splanchnic arterioles should make for a lowering of that pressure? Observation with the arteriometer shows that the arterial calibre is slightly lessened when the splanchnic diversion takes place. There is, therefore, apparently a compensatory reduction of the systemic area of the circulation; and the increased tonus of the arteries is one factor in raising the arterial blood-pressure, the other being cardiac —an increase in the output of the ventricle and stimulation of ventricular contraction.

These digestive waves are also present when the arterial pressure is above the normal range. In determining the arterial pressure in clinical work, a correction for the influence of digestion on the mean arterial pressure may be usefully made by applying the following rule: To deduct from a pressure observed in the first hour after a meal 15 mm. Hg., in the second hour 10 mm. Hg., and in the third hour 5 mm. Hg.

The best time to make a reliable observation of the mean arterial pressure is within an hour before a meal.

The study of the capillary and venous blood-pressures during the digestive circulatory wave has likewise afforded some interesting results. The venous blood-pressure is

easily determined by a method of using the hæmodynamometer elsewhere described *; but so far no reliable method for gauging the capillary blood-pressure has been suggested. I have, however, employed a method which is simple and practical; but as I hope to improve it I will not describe it. This method has so far shown that the capillary blood-pressure is considerably raised at the acme of the digestive circulatory wave, and that it then gradually falls during the decline of the disturbance. The rise and fall of the capillary blood-pressure, therefore, coincide with those of the arterial blood-pressure. The venous blood-pressure, on the other hand, falls during the full development of the digestive circulatory wave; sometimes, however, it falls immediately after the meal (A, fig. 2), but more generally it rises a little at first, concurrently with the increase of the arterial and capillary pressures, and then it falls (B, fig. 2), or it merely remains stationary, failing to rise with the other pressures (C, fig. 2). But in all cases the venous pressure rises rather suddenly after the acme of the circulatory disturbance is attained, and then it reads much higher than before the meal, and again concurs with the capillary pressure. Fig. 2 illustrates the behaviour of the three blood-pressures after a meal. Now were the capillary pressure to subside with the venous pressure we should infer that this concurrent fall of these blood-pressures was caused by contraction of the arterioles; and in clinical observation equally low readings of them, along with an increase of the arterial pressure, furnish good evidence of the predominance of arteriolar resistance. But the rise in the capillary pressure excludes this cause, and this rise together with the diminished venous pressure suggests an increase of resistance beyond the capillaries. We know that the venules and veins are endowed with muscular fibres, so that these vessels can offer a varying resistance to the onflow of blood from the capillaries. It is

* See *Journal of Physiology*, Cambridge and London, 1898, and "Blood and Blood-pressure," 1901.

true that these fibres are somewhat less abundant than in the arterioles and in the small arteries; but inasmuch as the capillary pressure is normally low, it is not necessary that the venules should be provided with so large an amount of muscular tissue as the arterioles, which have to resist the arterial blood-pressure, and have thus to shield the capillaries from that high pressure. These muscular fibres of the

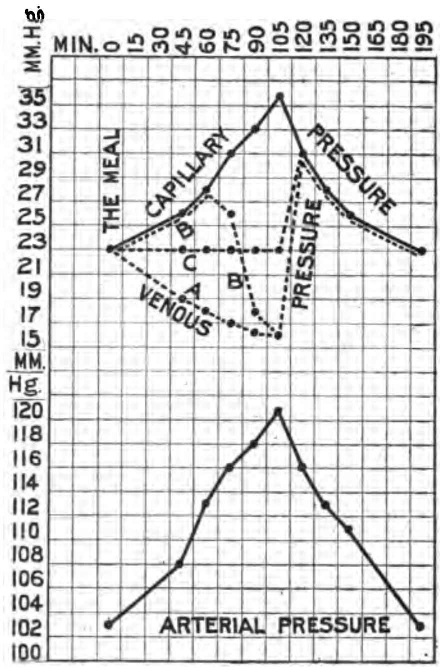

FIG. 2.—Diagram illustrating Concurrent Observations of the Mean Arterial Pressure, the Capillary and Venous Pressures every Fifteen Minutes after a Meal.

venules must surely serve some purpose in the economy of the circulation; but regarding it physiology has hitherto remained silent. The foregoing observations, however, suggest that during the digestive disturbance of the circulation, the venules play an important part in regulating the capillary blood-pressure; at one time, as at the acme of the disturbance, contracting and so increasing that pressure, and then relaxing and letting it down. I have, however, observed that contraction of the venules only comes into play when

the body is at rest, for it is overcome during exercise, which raises both the venous and capillary pressures together, though it may reassert itself when the exercise ceases. I have just lately discovered that my friend Sir Lauder Brunton, so long ago as in 1879, when writing on the contractility of the veins, anticipated this function of the venules. "It is obvious that, if venous radicles contract, they may oppose a resistance to the flow of blood in the capillaries, and by thus increasing the pressure within them, may cause more fluid to exude from them into the tissues."*

Why should the capillary pressure be raised during the digestive disturbance of the circulation? As suggested by Sir Lauder Brunton, a rise in capillary blood-pressure may cause an increased exudation of tissue fluid. The experimental work of Ludwig and Noll,† of Starling,‡ of Lazarus Barlow,§ and others, undoubtedly supports this view; and following a new method of observation by which the tissue-lymph may be measured, I have been fortunate enough to obtain confirmatory evidence of it in man. May not these periodically recurring variations of the capillary blood-pressure which accompany the act of digestion be of supreme importance in nutrition? Moreover, do they not afford us a glimpse of a much broader fact than is signified by the mere act of digestion? For when food is taken there is, it would seem, not only the internal flow of the digestive secretions, but there is likewise a concurrent exudation into every tissue of nourishing fluid expressed from the blood into the interstitial spaces. Should further inquiry substantiate this view, the physiological significance of the prolonged rhythmical movement in the circulation produced by the ingestion of food will be apparent.

In reading quite lately Professor Paulow's lectures on the

* "Collected Papers on the Circulation and Respiration," by Sir Lauder Brunton, F.R.S., 1903, p. 537.

† *Zeitschrift f. rat. Med.*, 1850, Bd. ix., S. 52.

‡ *Journal of Physiology*, Cambridge and London, vol. xvii.

§ *Journal of Physiology*, Cambridge and London, vol. xvi.

work of the digestive glands,* I could not avoid observing the similarity of the form and duration of his curve of the secretion of gastric juice in the dog after a meal, with the curves of arterial blood pressure incited by digestion in man—as if both were concurrent events, which proceeded from the same physiological movement in the system; the maximum secretion, like the acme of the digestive wave, being attained in an hour; and then the gradual subsidence of both occupying some three or four hours. For the purpose of comparison I have reproduced one of Paulow's gastric juice curves in fig. 3.

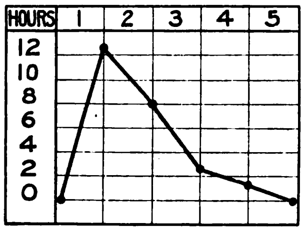

FIG. 3.—Curve of Secretion of Gastric Juice after a Meal of Flesh. After Paulow.

I have observed that the beverages, tea and coffee, produce a similar rhythmical disturbance of the circulation to that which follows the ordinary meals; it is, however, less pronounced and shorter (see fig. 1).

THE INFLUENCE OF EXERCISE ON BLOOD-PRESSURE.

It is now well known that the primary effect of exercise is to raise the arterial pressure, but I do not think it is as generally recognised as it should be that this immediate rise of pressure is but temporary, and is soon succeeded by a marked fall, which fall persists during the further continuance of the exercise and for some time after the cessation of it. The peripheral tubing very soon widens, and the rise is thus converted into a fall. Fig. 4 illustrates how quickly and how effectually the mean arterial pressure may be lowered

* "The Work of the Digestive Glands." Lectures by Professor J. P. Paulow. Translated into English by W. H. Thompson, M.D., &c., 1902.

by merely throwing the muscles of the limbs and trunk into a state of contraction for short intervals. You observe two deep indentations in the curve of the digestive wave; they are the impressions made on the normal course of that curve, produced by throwing the muscles into a state of sustained tension for two minutes. In spite of these interruptions the digestive wave of blood-pressure continues its course, and ultimately subsides in a normal manner. The effect is therefore only temporary; but it is instructive in showing how

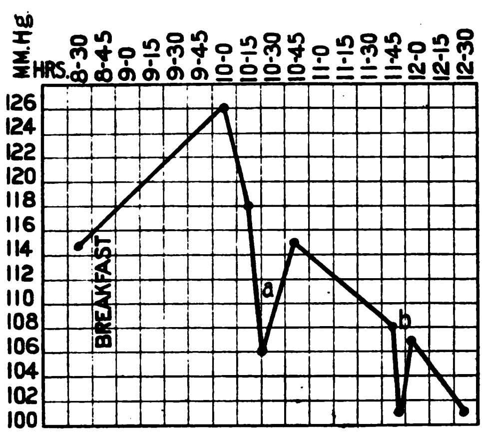

FIG. 4.—The effect of two minutes' Static Contraction of the Muscles (a and b) on the Digestive Curve of the Mean Arterial Pressure.

great is the power of muscular contraction in lowering the arterial blood-pressure. This is the fundamental fact in resistance exercises. But this fall in the arterial pressure is but a portion of the physiological fact we are now studying; it is simply the result of the widening of the arterioles produced by the muscular contraction—a fact which is proved by the rapid, though transitory, concurrent rise in the capillary and venous blood-pressures. It therefore follows that mere static muscular contraction lets down, as it were, a large volume of arterial blood into the capillaries, and in this way brings more oxygen within reach of the tissues, and thus raises the metabolic processes. But it may do more than this; for, by raising the capillary pressure, it may greatly accelerate

and increase the flow of interstitial fluid filtered from the blood into the vacuoles of the tissues, and may thus flush these spaces and favour the clearing away of residua from them. From the clinical standpoint such effects as these produced by mere muscular contraction should prove useful in the treatment of diseases of the suboxidation type, in which the removal of waste products is imperfect, as in chronic goutiness. Static contraction of the muscles produces all the physiological effects of exercises on the periphery of the circulation, thereby easing the unloading of the ventricle without increasing the work of the heart, as ordinary exercise does.

A large group of our cases at a health resort have as a prominent feature of their circulatory disturbances a hypertonic* state of their arteries and arterioles, and in a large majority of these cases the mean arterial pressure is considerably raised. In some such cases both the capillary and venous pressures are lowered together—showing the preponderance of arteriolar contraction; while in others the capillary pressure is raised along with the arterial, while the venous pressure is lessened—indicating the predominance of venular contraction. Now in such cases the pulse is generally *felt* to be small, and is often reported as feeble, and the hands and fingers are apt to be clammy and cold, and sometimes they may even afford a cold, fish-like impression to the touch. The unguarded physician is apt to regard these signs as indicating a feeble heart and a weak circulation, and when he places his hand over the apex and finds it displaced outwardly he is confirmed in that view. In many such cases the heart muscle remains unaffected; but in nearly all, the second aortic sound is markedly accentuated. In nine out of ten such cases the trouble originates in the periphery of the circulation. The physiological tonus of the arteries, arterioles and venules have passed the normal bounds and

* The appropriate term "arterial hypertonus" was first employed by Dr. Wm. Russell (*Lancet*, June 1, 1901, p. 1519).

become pathological. There is, in fact, a persistent hypertonic condition which often threatens to overmaster the ventricle. The embarrassment is peripheral, and the bravely acting heart muscle is apt in time to yield, and, indeed, does very frequently yield, and then there is established a new centre from which a fresh series of pathological deviations emanate. In a large majority of such cases the physiological measures applied at a well-equipped balneological resort will rectify the disordered peripheral mechanism, and then the blood-pressures (arterial, capillary and venous) either approximate to their normal relationship to one another, or they become normal. After the course of treatment, it is a matter of some importance to suggest such simple methods of preventive management as may be easily followed up at home, so that the benefit acquired from the visit may be maintained. Among other measures designed to this end, I have found static or tension exercises of considerable value. At first the duration of the sustained tension of the muscles should be brief—so as not to be irksome—and as time goes on it should be lengthened. The exercises should be practised perseveringly at all odd times and seasons, but especially during the hour before every meal—this being the time when Nature herself produces a normal fall in the arterial blood-pressure. It is interesting to find how such exercises will frequently warm the extremities. One patient (a doctor) volunteered the remark that in his case the effect resembled that of a dose of nitro-glycerine; and that reminds me that Brunton and Tunnicliffe suggested in a recent article that muscular contraction may produce some product which possesses the property of dilating blood-vessels.*

It is apparent that the ultimate physiological effect of muscular contraction on the circulation is much the same as that induced by warmth, namely, a widening of the peripheral channels and a consequent easing of the work of the heart and a proportionate lowering of the arterial pres-

* See *British Med. Journal,* October 16, 1897.

sure. But beyond this result, common to both, there is a difference between the therapeutic effect of warmth and that of exercise; for heat merely relaxes muscular fibre, while exercise—even though tiring at the time—is followed by improved tone and vigour. It seems to me that physiology has a promising suggestion to offer to account for this difference; for Ranke showed that whenever muscles contract they absorb water from the blood: now, that water is proteid-containing water, which, after serving the immediate needs demanded by the contraction, may provide for repair and construction. So that we may say that exercise, like heat, expands the contracted peripheral mechanism, and thus reduces the consequent increased arterial blood-pressure, but does more than heat in providing for repair.

It is an easy matter for you to test this lowering effect of muscular tension on the blood-pressure during the course of your examination of a case. I have frequently done so. Of course you must see that the patient preserves quiet and regular breathing when he throws the muscles into static contraction. You will not uncommonly observe, when the arterial pressure is raised, while the venous pressure is lowered, that after a minute's, or even after half a minute's, muscular tension the former will fall 20 or even 30 mm. Hg., and the latter will be doubled.

The Influence of Temperature on Blood-Pressure.

We now come to the third leading cause of variation in the blood-pressure, namely, temperature. We are all familiar with the contracting influence of a fall of temperature on the walls of the blood-vessels with rise in blood-pressure, and the relaxing effect of warmth with lowering of that pressure; but few of us, I think, quite realise how powerful is the influence of changing temperature, not only on the systemic blood-pressure, but on all the physiological processes governed by that pressure. With the view of obtaining some evidence bearing on this point, I registered daily at 8.30 every morning for over three months during last winter, the mean

arterial pressure, and some other physiological data, as well as the temperature as recorded in Stevenson's screen and in the room. Though these observations on the circulation were made in the house and before experiencing the influence of the outside air, the record obtained was certainly instructive; for it showed that the circulatory mechanism is very sensitive to thermic variations in the weather. The record is, of course, too long to quote in detail. Suffice it to say, that the average reading of the mean arterial pressure was 120 mm. Hg. for all the screen temperatures below 36° F., and 107 mm. Hg. or all those above that temperature.

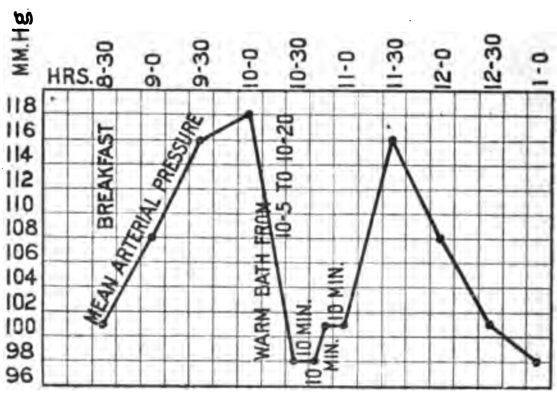

FIG. 5.—The Effect of a Warm Bath on the Digestive Curve of Mean Arterial Pressure.

Such striking effects being traceable in a normal subject, we gain some notion of the disturbing influence of thermic changes of the weather on many of our sensitive patients. Thus it may be that "cold snaps" (as they are popularly called) may throw as much additional strain on a yielding ventricle—even though the patient be quiescent—as might result from an uphill walk. Surely our patients suffering from arterial hypertonus need quite as much the protecting influence of an equable winter and spring as do our bronchitic invalids.

Fig. 5 shows the effect of a warm bath (temp. 100° F.) on the mean arterial pressure taken a little over an hour after a meal. You observe how deeply it indents the normal

course of the digestive wave of blood-pressure. The influence of warmth quickly passes off, as in this example. It is, nevertheless, a great power when judiciously directed in balneological practice. It acquires its force as a curative agent by repetition, as in a course of baths. My physiological observations have suggested that in certain cases the beneficial influence of warm immersion bathing may be enhanced by directing the patient to throw the muscles into a state of tension for short intervals during the immersion. In this way the dilating effect on the periphery of the circulation is increased, and the warm bathing becomes less relaxing. I have also found it useful to direct those patients who suffer unduly from the exhausting effects of warm immersion baths to contract the abdominal muscles frequently, so as to reduce the abdominal stasis which warmth encourages. Massage, and especially abdominal massage, is also a valuable addition to the warm immersion bath.

To return from this slight digression. Cold may raise the line of the digestive curve on the blood-pressure scale so that the commencement and the finish may read from 5 to 10 mm. higher than the strict normal (100), and warmth may lower these points 2 or 3 mm. These figures furnish somewhat of a guide to the clinical correction for the effects of temperature on the arterial pressure.

It will be recognised from this sketch of the respective parts taken by these three leading causes of variation in the arterial pressure—digestion, exercise, and temperature—that the influence of digestion is paramount and constant; for the long curves of rise and fall produced by the meals recur with perfect regularity, and persist beyond the temporary variations of the blood-pressure produced by muscular action and by temperature, which, therefore, modify the line of these curves in a mere transitory way.

The Influence of Altitude on the Blood-pressure.

In the winter of 1899-1900 I made some observations at Arosa (5,900 ft.) in Switzerland on the mean arterial pressure

with the view of ascertaining the effect of altitude upon it. These observations led me to conclude that in the winter months the blood-pressure is raised in high altitudes. Inasmuch as intensely cold weather prevailed during the visit, I could not on that account regard my observations as altogether conclusive; especially, too, as other observers were led to believe that altitude lowered the blood-pressure. Summer is undoubtedly a more suitable period of the year for observations of this kind than winter; for then there is less liability to encounter the disturbing influence of a low temperature. Unfortunately for myself, I can only make any such observations in the winter: still, even then they may prove instructive; for, if it be a fact that altitude does lower the blood pressure, and if that lowering influence is apparent in the cold months, it should on this account be all the more readily accepted.

Having, last January and February, five or six weeks at my disposal, I spent them in Switzerland, where I made a large number of observations at different altitudes, and at some (Châteaux d'Oex, St. Moritz, Zurich, Klosters, and Süs) the blood-presseur was taken at different times. At Château d'Oex (3,498 ft.) and at St. Moritz (6,100 ft.) serial observations were made at 8.30 every morning in a warm room, and a number of digestive waves were recorded, and the effects of exercise on the blood-pressures at these altitudes were also determined. Having previous to the visit made a large number of observations of the blood-pressure under the same conditions at home, I had the advantage of having a well-worked-out standard for comparison. Besides these observations on myself I made others on another subject, on many visitors, and on some residents.

Now what is the teaching afforded by the three groups of the observations, namely (1) those made apart from the influence of digestion and exercise; (2) those afforded by the digestive waves and (3) those furnished by exercise?

In fig. 6 are plotted out the mean arterial pressures determined at 8.30 a.m. or an hour before a meal, in a state of

rest in London, and at fourteen different altitudes, advancing progressively from 1,128 to 7,835 ft. You will observe that at about 1,000 ft. there is no appreciable change; that a marked fall is apparent when a little over 2,000 ft. is reached; that at 3,500 ft. (Château d'Oex) the blood-pressure, though somewhat higher than at the lowest point reached, is much lower than at home; and that above that altitude (3,500 ft.) there is a rise progressive with the altitude until we reach the highest point, the Fluela Pass (7,835 ft.).

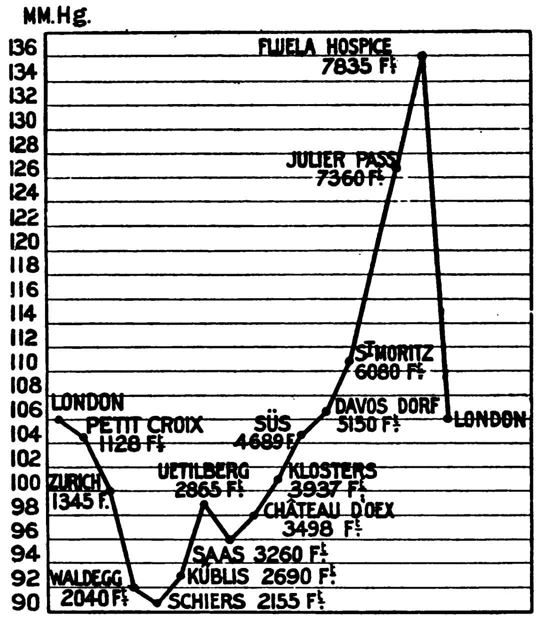

FIG. 6.—Mean arterial pressure taken at 8.30 a.m., or an hour before a meal, at various altitudes in Switzerland in January and February, 1903.

In fig. 7 are recorded the consecutive morning observations at Château d'Oex and St. Moritz (8.30). You observe the relative position of the two records on the scale: the spurts of pressure above the lowest readings were due to falls of temperature, as shown in the lower curves. Guided by my previous observations on the effects of variations in the temperature on the blood-pressure at home, I am quite sure that such decided falls in the thermometer as occurred at

Château d'Oex and at St. Moritz would in our own climate have produced much greater impressions on the blood-pressure than are here recorded.

In fig. 8 are shown two digestive waves of blood-pressure (both after lunch without alcohol), one (*a*) taken at Château

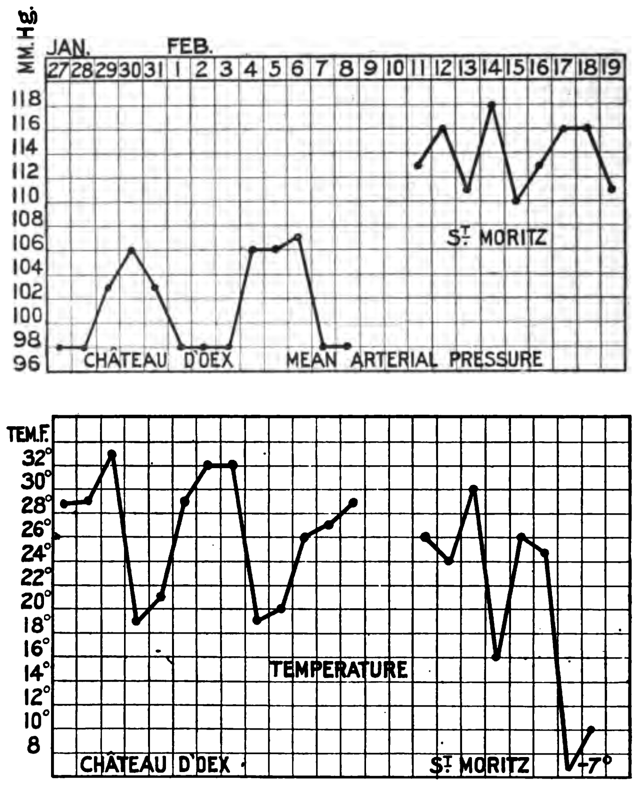

FIG. 7.—Consecutive morning (8.30) observations of the mean arterial pressure and temperature at Château d'Oex and St. Moritz.

d'Oex and the other (*b*) at St. Moritz. These waves are typical of others. You observe that the wave at Château d'Oex begins at and falls to a lower point on the blood-pressure scale, namely, 98 instead of 110 mm. Hg., as at St. Moritz.

The effects of exercise on the arterial pressure also show that the pressure is lower at Château d'Oex than at home or at St. Moritz, and that it is higher at St. Moritz than at

home. At home the usual effect of active exercise is to cause a fall of my arterial pressure to 97 mm. Hg. (observed just after the exercise is over); at Château d'Oex a similar amount of exercise reduced the pressure to 92; but at St. Moritz I could not diminish it below 105.

After completing the foregoing observations I made some interesting readings of the arterial pressure at Zurich, where there is a railway which ascends from 1,345 ft. (Zurich) to 2,865 ft. (Uetliberg), with a midway halt, 2,040 ft. (Waldegg).

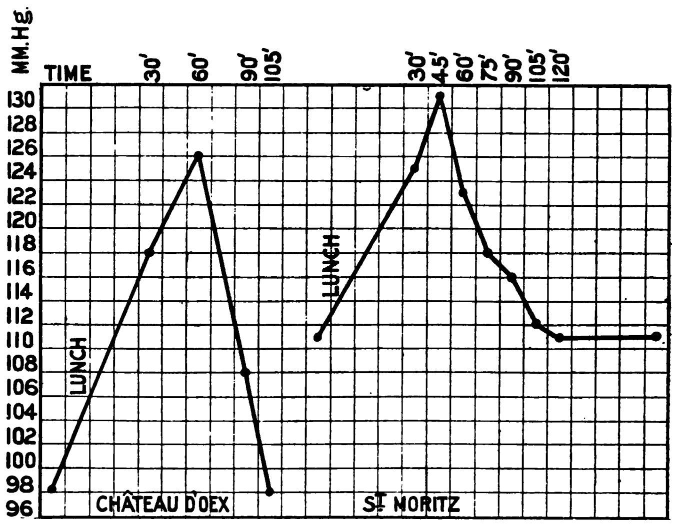

FIG. 8.—Digestive waves of arterial pressure at Château d'Oex and St. Moritz.

The uniform temperature and rest of the railway carriage afforded the most favourable conditions for comparable observations of the blood-pressure. The results furnished by the up and down journeys, which corroborate each other, appear in fig. 6, and confirm in a general way the previous observations made at similar altitudes.

The concurrent testimony of all these observations made in winter, points, I think, to the conclusion that altitude does lower the blood-pressure within certain limits—and especially so between 2,000 and 3,500 ft.—above which the pressure rises.

When one thinks of it, it is surely improbable that altitude should either lower or raise the blood-pressure progressively throughout all gradations; for in either case life would soon be threatened or would cease. We know that Nature when dealing with organic life does not, as a rule, work in straight lines; it is but the limitations of our view that give us that impression. She is ever deviating by her corrections to her beneficent ends. We should not, therefore, be surprised at this contrary effect of altitude on the blood-pressure, as it is apparently but an example of this universal law; for the observations suggest that at a certain point the lowering influence of the reduced atmospheric pressure is met by an adjustment on the part of the organism. How is this adjustment brought about? The observations show that in the higher altitudes (6,000 ft. as at St. Moritz) the heart's action is more frequent, and the calibre of the arteries is somewhat smaller than in the lower elevations (3,000 ft. or so at Chateau d'Oex). The morning observations give an average pulse rate of 76 at St. Moritz and of 71 at Château d'Oex; and an average radial calibre 0·4 mm. less at the former than at the latter place.

I think we may therefore conclude that the progressive rise in the mean arterial pressure observed in the higher elevations is the result of an increase of the output of the heart and of the normal tonus of the arteries.

Observations at St. Moritz on several visitors—even on those who had been sojourning there for two and three months—and on one whom I had observed at Chateau d'Oex, were exactly similar to those on myself; but those made on a few natives showed that the mean arterial pressure in them was lower—in fact, it was much the same as in England. From this it may be inferred that acclimatisation in a high altitude is not a question of a few months only.

I am sorry I could not prolong my visit so as to extend these observations to other altitudes and to verify or to correct those already made by repetition; and I regret this the more because at the highest point reached—namely, on the Fluela

Pass, 7,835 ft.—it seemed to me as if a second compensation, having for its object a reduction of the blood-pressure, was coming into play—namely, a vagus effect. I hesitate to mention this single observation, as there may be nothing in it. I was, however, struck with the fall of ten beats per minute below the average pulse-rate which I had observed at St. Moritz, as a slow pulse at the highest altitude reached seemed to be somewhat noteworthy. Should a vagus effect develop in still higher elevations it would, of course, counteract the rise of blood-pressure maintained by a further increase of the arterial tonus, and might afford a suggestion as to the cause of that mysterious ailment "mountain sickness."

I merely give you my limited observations, which without further extension you should regard as but tentative, though they were made with care so as to exclude fallacies as much as possible. I trust that other observers may be induced to take up this work and report their results. Climatology is sorely in need of exact physiological data; and we cannot have too many good observers. I think it is highly probable that in the warm months the lowering influence of altitude on the blood-pressure may extend to a much higher limit than my observations made in winter indicate, for warmth reduces the arterial tonus. But so far as these observations go I am inclined to think they have a suggestive bearing on practical climatology. I am not aware of a climatic condition that will lower the mean arterial pressure to the same extent as the medium altitudes. Why should we not think of this when deciding where to send some of our patients with *plus* arterial pressure in the winter months? Then, again, our colleagues at Aix-les-Bains, and other foreign bathing resorts for the gouty, wisely advise their patients after the "course" to resort to a moderate altitude for their "after cure"; now, according to these observations this advice means that the effect of the baths in lowering the arterial pressure will be maintained, even though the course of treatment has terminated. Can we not utilise some of our own moderate altitudes in a similar way after

a course at one of our bathing resorts? Perhaps, however, I am looking too far ahead, as the question of accommodation on our mountain sides is doubtful. Then there is a thought that will occur to you in connection with the raised blood-pressure maintained in the winter by the higher altitudes. These should be well adapted to the climatic treatment of cases which require construction and repair, such, for example, as the phthisical; and should be contra-indicated in cases in which the removal of waste products should be the keynote of treatment, such as in gout and chronic Bright's disease; and should be further contra-indicated when we cannot be sure that the heart muscle will safely bear the additional strain of a high altitude.

The Balance between the Visceral Blood Supply and the Systemic Blood Supply.

There is another branch of our subject which, having an important bearing on practical medicine, I will briefly refer to. For many years I have been studying the evidence bearing on the relation which exists in health, and which is so often perverted in disease, between the quantum of blood in the abdominal area and that in the systemic area. This is a large subject which cannot be adequately handled, were a lengthened address devoted to it—much less in the few minutes that remain to me; I will, however, endeavour to outline it sufficiently, I hope, to enable you to see some of its possibilities and bearings on practice.

In the earlier observations of ten years ago, I inferred that the volume of the blood in the abdomen was increased when the radial calibre (determined by the arteriometer) became considerably enlarged on the patient assuming the recumbent posture—a reduction of the calibre in that position being the normal variation in persons of good vasomotor tone. The explanation of this reversed reading that suggested itself was, that the diminution or loss of gravitation control in the splanchnic area led to a loading of the capacious abdominal veins in the erect position of the body, and

that when the circulation was freed from the influence of gravity in the horizontal position, the surplus blood was liberated, and merged itself into the general circulation, and thus the systemic arteries became fuller and larger in that position. Though this was but an indirect way of clinically testing whether the gravity control of the splanchnic was impaired or lost, I found it to be a most useful clinical guide, and one on which I placed—and still place—much reliance. But during the past few years I have been fortunate enough to find a supplementary method, which provides direct corroboration of the inference drawn from the reversed postural variation of the radial calibre; it is based on the displacement of the surplus abdominal blood by means of a weight, and on the measurement of the effect which this displacement produces on the systemic blood-pressure. The patient having assumed the recumbent position, the mean arterial pressure is taken from the radial or ulnar artery—the arm being extended in a line with the body; then a bag holding 14 lb. of shot is placed on the abdomen, and the arterial pressure is again read. The result of observation has shown that in persons of healthy tone the arterial pressure is not altered, or is not very appreciably altered by the weight—except for a short time after a meal, when it is raised about 10 mm. Hg. In the course of clinical work, however, a large number of cases are met with which afford a marked rise (of from 10 to 20 or even 30 or 35 mm. Hg.) at all times. It is this fact which is a matter of interest, because it is abnormal; and this interest is increased when it is found that, after suitable treatment, in a large proportion of these cases the weight will fail to produce a rise in the blood-pressures, when it is presumed the abdominal stasis has passed away.

This clinical sign (for such I take it to be) characterises a large group of cases. What does it signify? The only satisfactory explanation of it which I can discover, consistent with all the observations made, is, that in the cases referred to, the weight displaces at all times some considerable volume of blood from the abdomen, just as it does in health shortly

after a meal only, and for the same reason : namely, because the volume of the splanchnic blood is increased. There is, therefore, a continuous increase of the splanchnic area instead of an intermittent and transitory one as in health. The condition may be described as one of splanchnic stasis. How is it brought about ? Broadly, there appear to me to be four types of cases presenting this clinical sign.

Firstly, there is the group of cases due to cardiac failure, in which a certain volume of the blood falls away from the control of the circulatory forces, and passively collects in the deep abdominal veins.

Secondly, blood often collects unduly in these veins, when the muscles of the abdominal wall become flabby and toneless, as after pregnancy, the removal of abdominal tumours, &c., Nature's abdominal belt having become weakened.

Thirdly, there is a group of cases which may be termed auto-toxæmic, in which the arteries are hypertonic (the contraction being shown by the arteriometer), a condition which may result from the irritating presence in the blood of auto-generated products and residua, as in chronic goutiness and in various abdominal disorders. In such cases it would seem as if a certain portion of the blood is simply drifted, as it were, into the abdominal area from contraction of the systemic area.

Fourthly, there is a very large group of cases depending on diminished tone of the splanchnic arterioles, so that at all times in the erect postures a considerable volume of blood simply drains, uncontrolled by these vessels, into the capacious abdominal veins. This class of case includes patients suffering from all forms and degrees of exhaustion and lowering of tone, however produced ; but the most prominent members are neurasthenics. In every case of neurasthenia I have so far met with—and I have seen not a few—the shot bag test has invariably afforded decisive evidence of pronounced splanchnic stasis. I need scarcely point out the usefulness of an objective sign, which the observer can himself fully

appreciate, in an ailment like neurasthenia, with its interminable catalogue of subjective symptoms.

In all these classes of cases the shot bag and the blood-pressure gauge indicate that there is a considerable volume of blood constantly present in excess in the wrong place—in the abdomen. The blood thus withdrawn from circulation (for such it is) will doubtless limit and cripple the nutrition of the whole organism, and especially that of the master centres.

Now, though splanchnic stasis is always caused by something—such as cardiac weakness, auto-toxæmia, exhaustion of nerve centre—it is itself a cause of endless derangements of function so long as it remains uncorrected. It is, indeed, the centre of an ever-widening vicious circle. To follow its effects in all their clinical ramifications would lead me too far afield. Suffice it to say that beyond the incapacitating influence which it produces on the brain and the muscles—in limiting the power of thought and exercise—splanchnic stasis favours the production of various abdominal ailments and derangements of the cerebral circulation. In the abdomen it predisposes to catarrhal inflammations of the various hollow viscera, to gastrectasis, enterectasis, and their sequelæ, fermentation and the generation of toxins, to hepatic derangements, to menorrhagia, &c. I have also frequently found splanchnic stasis associated with marked and persistent forms of vertigo, and also with insomnia.

Draining of blood into the splanchnic veins frequently produces a pale quasi-anæmic appearance, especially in young subjects. The pallor in some such cases may, of course, be due in part to actual anæmia; it is not so, however, as a rule, but is entirely caused by the reduced volume of blood in the vessels of the skin, lips, conjunctivæ, &c.* In a word, it suggests hæmorrhage; and in the sense of blood diverted from circulation, there is virtual hæmorrhage, only

* Unless the blood is examined it is not easy to determine whether the anæmic appearance is due to actual anæmia or to splanchnic drain.

the blood withdrawn is temporarily resting, as it were, in the splanchnic veins. In most cases there is a slight loss of colour and a faded look, which appeal to the practised eye as suggestive of splanchnic stasis. In fact there is a lowered capillary pressure in the systemic area.

There is, I think, some ground for suspecting that splanchnic stasis may be occasionally set up for the purpose of relieving the heart and the circulation; the volume of the blood in some cases being, perhaps, in excess, or if normal, it may nevertheless be too much for a failing ventricle, and so a portion of the blood drops out of circulation and gathers in the capacious splanchnic veins, which form a convenient over-flow chamber. This view probably affords one explanation of the discomfort produced in certain cases by the application of the shot bag to the abdomen, the breathing becoming hurried and oppressed and the heart's action becoming disturbed. I have sometimes observed that when the ventricle is yielding under increased peripheral resistance and the apex is felt well out to the left in the sitting position, on the patient assuming the recumbent posture the arterial pressure will fall and the apex will come distinctly within the nipple line; then the application of the shot bag will cause the apex to move outwards again, and the arterial pressure will rise as in the sitting posture. In such cases of diminished tone in the ventricular wall, it is not desirable to attempt to bring the excess of splanchnic blood into circulation, for by doing so we add to the load, which is already too much for the ventricle. Our aim should be first of all to tone the ventricle. In fact, splanchnic stasis of this type is frequently rectified by a course of cardiac tonics alone.

In those cases in which the abdominal muscles are soft and atrophied, and especially when the abdomen is pendulous, the practitioner is often tempted to order abdominal belts; but, inasmuch as mechanical supports of this kind rest the muscles, and in this way perpetuate the atonic condition of the abdominal wall, though they may afford temporary relief and comfort, they should, if possible, be avoided. Per-

sistent attempts should be made by electrical treatment and by specially devised exercises to strengthen the muscles of the abdominal wall.

In all cases in which splanchnic strain is the result of asthenia the treatment should be concentrated on the cause of the stasis, namely, on the toneless state of the splanchnic arterioles. General tonic treatment alone will sometimes suffice to tone up these vessels; but it is always aided by the adoption of suitable measures addressed to the splanchnic area itself. Your knowledge of physiology will now afford valuable clinical guidance. I have referred to the fact that in healthy subjects the shot bag may afford a rise in the arterial pressure for a short time after a meal. Should the splanchnic arterioles be more open than they usually are, they will be specially so during the first hour of digestion, when the erect position of the body will aggravate the splanchnic stasis. Hence the importance of absolute recumbency for an hour after the meals, and especially after lunch and dinner. Then before the patient rises it is desirable if possible to incite some contraction of the arterioles; and for this purpose I have found it useful to advise him to apply a shot bag (weighing from 7 to 11 lb.) to the abdomen for ten minutes, through which he may massage the abdomen. Deep and thorough massage of the abdomen should also be systematically practised for ten minutes some time during the hour before each meal; and for this purpose the shot bag has been found valuable, as through it as thorough an effect can be obtained by the patient himself as by the hand of a masseur. Direct abdominal douching is also of considerable value in the treatment of splanchnic inadequacy; and occasionally I have seen the D'Arsonval current useful.

In neurasthenia the existence of splanchnic stasis provides the *rationale* of the rest cure, now regarded as an important factor in the successful treatment of this ailment. In the less severe cases the recourse to absolute rest and isolation, however, becomes less necessary when sufficient prominence is given to the measures which favour the restoration of

tone to the splanchnic arterioles, and when such measures are perseveringly followed up.

Conclusion.

Though our knowledge of the physics of the circulation is now considerably advanced, there remains much yet to be learnt, especially in regard to the peripheral part of the circulation—that part which is so intimately associated with nutrition and its derangements, and with various pathological conditions, such as chronic gout; and it is to be hoped that the further study of this portion of the circulatory mechanism will throw some light on what may be termed the physics of metabolism. We practitioners in balneology attach much importance to the powerful influence which the measures at our command exert on the distal parts of the circulation; for the outlying area of the circulatory tubing, actuated as it is by delicately balanced forces, is specially prone to get out of gear, and observation teaches us that the physiological methods of treatment we employ are more potent than drugs in clearing away and rectifying peripheral obstructions and embarrassments.

CLIMATES AND HEALTH RESORTS IN THE DOMINION OF CANADA.

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PHILADELPHIA.

THE Canadian provinces which stretch from Newfoundland and the Gulf of St. Lawrence on the east, to Lake Superior and Manitoba on the west, present wide differences in respect to climate. Throughout this region there is, as a rule, a short summer followed by a rigorous winter. Although Quebec is nearer the ocean, Ontario is the more favourably situated, much of its area stretching below 45° parallel. Toronto is upon the same degree of latitude as Portland, Maine, and the extreme southern limit of Ontario is upon the shore of Lake Erie. The great lakes exert a strong influence on the climate of Ontario, insuring less severe extremes of temperature and a more abundant rainfall than in Manitoba, Assiniboia, Saskatchewan, Athabasca, and Alberta.

The low temperatures recorded in winter in Ontario are comparable with those obtained in Michigan and the northern portions of New York and New England. The winters are characterised by steady cold, a heavy snowfall, and at least three months of sleighing. In Quebec the snow begins to fall in November and lasts for about five months.

The lower lake region and the St. Lawrence valley are the most frequent paths of storms. Hence this region experiences a large percentage of cloudy days and a comparatively heavy precipitation. Tornadoes are rare but may occur in the St. Lawrence Valley during the summer months.* Canadian winters, while intensely cold, are not attended with the discomfort that might be expected from a consideration of temperature records alone. The dry, bracing atmosphere renders

* A tornado passed through the towns of Finch, Winchester and Chesterville, Ontario (lat. 45 N., long. 75 N.), on July 18, 1902, killing three persons, injuring ten and destroying 200,000 dols. worth of property. Its path was eighty rods in width; it occurred after the passage of an area of low pressure north of Montreal.

the coldest days frequently the most enjoyable and invigorating. The freedom of the interior districts from the easterly winds and damp fogs of the coast, as well as from the sharp changes of weather so common in the United States, robs the winter of many of its terrors.

Many visit Montreal in midwinter when gay ice carnivals draw thither large numbers of people from Canada and the United States. At this time an abundance of snow and ice is essential to pleasure, and the supply is ample. Snow in Canada protects the grain and facilitates transportation. It is indeed indispensable to the great lumber interests, and renders the remote regions in the north accessible. The rainfall increases from the interior to the coast. The highest average of yearly rainfall is at Cape Breton, where it reaches 55 inches. Halifax has 43 inches; Sydney, 49; Montreal, 27; Quebec, 19; Ontario, Toronto, 29; Barrie and Peterboro', 20; Winnipeg, Manitoba, 16; and Spence's Bridge, in British Columbia, only 4 inches.

Snow varies greatly in amount, but averages 115 inches in a year in Quebec, 112 inches at Prince Edward Island, 62 inches in Manitoba, and 33 inches at Spence's Bridge, British Columbia. It usually first begins to fall in October throughout the interior provinces, but occurs somewhat later on the coast.

The winters of north-west, upon the whole, are agreeable. The moccasin is dry and comfortable throughout, and no thaw, strictly speaking, takes place till spring, no matter how mild the weather may be. The snow, though shallow, wears well and differs greatly from eastern snow. Its flake is dry and hard and its gritty consistence resembles white slippery sand more than anything else. Generally speaking, the farther west the shallower the snow until the rocky mountains are reached. Heavy snow-falls occur in the mountains, and especially about Glacier and throughout the Selkirks.

The average of yearly maximum temperatures in Ontario is from 89 to 96°; in Quebec, 90 to 96°; New Brunswick, 79 to 88°; Nova Scotia and Prince Edward Island, 85 to 88°; Manitoba, Alberta, and British Columbia, 96 to 97° F.

The lowest average of yearly records in Ontario are Goderich, 8°; Toronto, 12°; Barrie and Peterborough, 26°;

Pembroke, 37°. In Quebec, 23°; Montreal, 17°. In St. John, N.B., 10°. In Nova Scotia, 8 to 9°.

NEWFOUNDLAND.—This large island lies east of Canada, between 47 and 52° north latitude. It is the nearest point to Europe on the American coast. Its southern extremity, Cape Race, is in the same latitude with northern Michigan and Seattle, Washington. St. John's, the principal city, is situated on a peninsula, with a well-protected harbour, from which steamers leave for Quebec, New York, Baltimore, and for the coast of Labrador. The cliffs rise to a height of 500 feet, affording the most picturesque scenery. There are various interesting trips by water from St. John's.

MEAN TEMPERATURE FOR EACH MONTH AND FOR THE YEAR IN THE SEVERAL PROVINCES AND STATIONS IN CANADA.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Ontario ...	19·3	20·2	26·7	42·6	54·4	65·6	69·8	68·1	58·6	47·4	33·0	20·5	43·8
Quebec ...	13·5	15·9	25·3	41·8	54·9	66·0	70·2	68·1	58·7	47	33·1	17·1	42·6
New Brunswick	16·1	18·1	26·4	37·6	46·4	57·7	62·8	61·4	54·2	45·1	32·3	19·8	39·9
Nova Scotia ...	22·3	21·2	26·7	35·9	44·6	56·6	63·3	62·9	56·4	48·2	36·5	25·5	41·7
P. E. Island ...	20·5	14·7	27·6	33·1	46·2	54·0	64·3	62·7	57·2	49·4	32·7	22·9	40·5
Manitoba ...	2·9	3·0	9·0	30·2	51·2	63·6	65·9	64·8	51·3	40	14·6	0·6	32·6
Brit. Columbia	22·8	28·8	40·8	51·9	59·9	64·5	72·2	70·7	61·4	49·3	30	24·5	48·1
Newfoundland	25·6	22·7	28·7	33·3	43·0	50·7	60·3	60·1	55·8	49·6	38	28·9	41·4
Toronto ...	22·9	22·9	29·3	41·0	51·7	61·7	67·4	66·2	58·1	45·9	36·2	25·7	44·1
Montreal ...	16·8	18·6	26·9	43·5	57·2	66·4	72·2	69·8	60·8	47·5	33·6	18·9	44·3
St. John, N.B.	18·4	21·4	27·8	38·2	46·7	54·7	59·7	59·5	54·5	45·6	35·7	22·8	40·3
Halifax ...	22·9	23·7	28·1	38·1	47·4	59·7	63·5	63·3	57·4	48·3	37·8	25·8	43·1

The climate of Newfoundland is cold and damp, and unsuitable for persons unaccustomed to the bleak shores of the north-eastern coast. The mean annual temperature is 41·4° F. The mean monthly temperatures (Fahrenheit) beginning with January are as follows:—25·6°, 22·7°, 28·7°, 33·3°, 43°, 50·7°, 60·3°, 60·1°, 55·8°, 49·6°, 38°, 28·9°.

The isotherm passes through Montreal, Marquette, Michigan, Northern Minnesota, and North and South Dakota. The annual rainfall is over 50 inches; the mean relative humidity over 80 per cent.; and the annual cloudiness over 60 per cent. The summer is the only desirable season for visiting Newfoundland, and even then provision must be made for cold weather. Men suffering from nervous depression or mental fatigue, who

might be interested in sport or in the remarkable scenery of the region or who would escape hay-fever, constitute the class of cases likely to receive benefit from such a trip.

PRINCE EDWARD ISLAND.—Prince Edward Island, called the "Garden of the Gulf," is north of Nova Scotia in the Gulf of St. Lawrence, and is reached by the Intercolonial Railway, or by steamer to St. John. There are good accommodations at Charlottetown and good fishing and shooting in the vicinity. The climate is cool and fogs are likely to occur, but the air is stimulating and the scenery fine. Summerside, near the western end and Rustico Beach on the north side are favourite resorts.

CAPE BRETON.—The island of Cape Breton is an island north-east of Nova Scotia. The climate is cool and the humidity is high. It is unsuitable for the tuberculous, but is attractive for overworked business men, neurasthenics, and those who enjoy a marine climate. Inland salt-water lakes render the country extremely picturesque. Bras d'Or Lakes penetrate the island, and Baddeck is delightfully situated near the centre of the island. The Margarie is a famous salmon stream.

NOVA SCOTIA.—Nova Scotia is a peninsula with a cool ocean climate. It is a favourite resort of the tourist in summer. The climate is too damp for invalids, but a summer voyage to Nova Scotia is refreshing to the overworked, and the scenery is the main attraction. Sufferers from hay-fever find immunity at the usual resorts of Nova Scotia. Warm clothing is imperatively demanded.

HALIFAX (latitude 45° north), a fine seaport on the ocean side of Nova Scotia, is interesting for its citadel and fine view of the harbour. It is a good resort for those suffering from hay-fever, and makes a convenient destination for those desiring a short northerly ocean voyage from the United States. The climate is cold and damp, and fogs are common.

NEW BRUNSWICK.—North of New Brunswick is the famous Chaleur Bay, north of which lie Bonaventure and Gaspé, counties of Quebec. The rivers emptying into this bay are famous for remarkably fine salmon fishing, and are visited in June by men of distinction from various parts of the United States and Canada. The principal rivers are the Restigouche, Nepisiguit,

Jacquet, Metapedia, Cascapedia, Bonaventure, and St John's of Gaspé. There are numerous club-houses, such as the Camp Harmony Angling Club on the Restigouche, the famous millionaire fishermen's club-house known as the Restigouche Salmon Club, fishing lodges, and a few primitive hotels where visitors are entertained. While all the best fishing grounds are in private hands, fair salmon fishing and trout fishing can be had by those who are not members of clubs.

Bathurst, on the south shore of Chaleur Bay, and New Carlisle, on the north shore, are summer resorts, and there are fine beaches where bathing is enjoyed in midsummer. The Chaleur Bay is not reached by the Arctic current, and its shallow waters are warmer than those farther to the eastward.

Among other attractive places are Dalhousie and Campbellton, N.B., Carleton, Gaspé and Percé, P.Q.

In southern New Brunswick St. Andrews is probably the best known resort. It has an excellent hotel with famous links, and has a climate very much like that of Eastport, Maine, which is across the bay. Its mean yearly temperature is about 40·5° F., with a maximum of 81·6° and a minimum of 17°. The rainfall is 53 inches, and mean annual relative humidity 73 per cent. The summer climate is cool and rather sedative. St. Andrews is a very quiet, colonial town, and is easily reached from Eastport by boat or by the Atlantic division of the Canadian Pacific Railway. St. John, on the Bay of Fundy, is a city of 50,000 inhabitants, and has a cool, stimulating climate. It is used to some extent as a resort. The Chaleur Bay resorts are reached by the Intercolonial Railway from Quebec, Halifax, or St. John; or from Frederickton *viâ* Canada Eastern Railway.

Along the St. Lawrence there are a few summer resorts below Quebec that are attractive. Chief of these are Murray Bay on the north shore, and Cacouna on the south shore below Riviere du Loup. The bathing, boating and character of the accommodations are excellent.

Tadousac, on the St. Lawrence, near the mouth of the Saguenay River, is a well situated and a favourite resort. Beyond Tadousac, the north shore is desolate and forbidding and is little visited. Roberval, near Lake St. John, is the

northernmost resort in Quebec, and is very attractive for sport afforded and for its excellent accommodations.

Newfoundland, Cape Breton, Nova Scotia, and Prince Edward Island are exposed to the influences of the Atlantic Ocean and of the cold Polar current which sweeps down from the coast of Labrador, bringing ice and fog and chilling the air for a large portion of the year.

These regions are beautifully green in summer and capable of agriculture, although the season suitable for such operations is short. Their exposed position and variability of weather render the climate a trying one and tolerable as a permanent place of residence only for those in vigorous health.

In the eastern provinces it is not uncommon to have early in the year a period of intense cold followed by a revulsion of temperature commonly known as the "January thaw." The temperature of the coast is not one of great extremes, and in summer is of remarkable equability.

Trips to New Brunswick, Nova Scotia, Cape Breton, and Newfoundland are sometimes advisable for the sake of recreation, but only in midsummer fine weather may be found, but even at that season cold weather will certainly be met with, and the warmest clothing and waterproof garments will be needed.* The proximity of fields of ice and fog banks renders these trips sometimes disappointing. Off the shore of Nova Scotia, and particularly Cape Breton, rapid changes of temperature occur with the advent of fog. The islands of the Gulf and particularly those of the Labrador coast abound in waterfowl, but they are also infested with voracious black flies and mosquitoes. Excursions are often interrupted by fog, and many accidents have occurred to those who, having wandered too far from their base of supplies, become enveloped in these unwelcome clouds that roll in from the sea.

The straits of Belle Isle are frequently crowded with floating ice at this season, and bergs are familiar objects all along the Labrador.

In August the days are warm and it is possible in a voyage

* For an interesting description of Cape Breton Island and Nova Scotia, see "Baddeck," by Chas. Dudley Warner.

to these shores to observe a temperature as high as 78° F. while a hundred or more icebergs may be counted from the ship's deck. The usual temperature during cloud or fog at this season is about 45° F., and ordinary winter clothing is found to be no adequate protection from its penetrating chill. Heavy underclothing and outer garments, blankets, rubber coats, leggings, and heavy leather boots are indispensable.

For anybody who is thoroughly strong and healthy, free from any tendency to lung trouble, with a fondness for gunning, fishing, and "roughing it," such a trip will afford much amusement, provided a congenial party participate and the vessel be especially fitted with conveniences suitable for their entertainment.

In the province of Quebec, about one mile from Ste. Agathe des Monts, the Laurentian sanatorium for the treatment of tuberculosis was recently inaugurated, but was destroyed by fire in June, 1902. Ste. Agathe is sixty-four miles from Montreal, and is largely built up with summer residences. The institution was about midway on the declivity of a hill, at an elevation of 1,550 feet. The soil is very porous; the drainage is thorough. The Laurentians have been called the "Adirondacks of Canada," having many of the features, physical and climatic, of that celebrated plateau, their average elevation being about 1,500 and 1,800 feet respectively. The immense pine forests, together with the moderate temperature, constitute the chief characteristics of this Canadian district. We trust that the Laurentian Sanatorium will be soon rebuilt. It was well conducted and seemed destined to a wide sphere of usefulness.

ONTARIO.—The Caledonia Springs are about half-way between Montreal and Ottawa. They are saline sulphur waters and are useful in the treatment of gout, rheumatism, and allied neuralgias. There is a complete bathing establishment, and the waters are sold extensively. The St. Leon and Alpha Springs, near Arnprior, are of similar character.

The THOUSAND ISLANDS lie in the St. Lawrence River, between New York and Canada, near the outlet of Lake Ontario, and extend down the river for forty miles. This remarkable group of islands numbers over 1,600, some are several miles in length. They afford delightful sites for

cottages and camps, and are well provided with hotels. The principal islands are Round Island and Wellesley Island, directly opposite Alexandria Bay. Alexandria Bay, the lakes of Theresa, Clayton, and Cape Vincent, near Lake Ontario, are excellent for fishing and abound in camps and cottages. The air is cool and stimulating, and the entire region is useful for the relief of hay-fever and insomnia. The annual mean temperature at Ogdensburg, fifty miles down the St. Lawrence, is 45·2° F., and during June, July, August and September, the means in 1899 were 65·8, 68, 70·7, and 58·2° F. The extremes were 20 and 93° F. The Thousand Islands are reached by the Grand Trunk Railway from Montreal or Toronto, or by steamer.

Two miles from the town of Gravenhurst, on the northern division of the Grand Trunk Railway, 115 miles from Toronto, is situated the Muskoka Cottage Sanatorium for the treatment of tuberculosis. It has an altitude of nearly 800 feet, and is on the shores of Lake Muskoka. The building is in a beautifully wooded park of fifty acres, and is sheltered from north and north-west winds by rocky ridges and pine forests. The soil is porous, dry, and of rocky formation, of the Laurentian system. The water is soft. The climate is bracing, and the region is considered favourable for the relief of asthma and hay fever. The present sanatorium accommodation is for patients in the incipient stage. The main building was erected in 1897 by gifts from Messrs. W. J. Gage and Hart A. Massey, of Toronto, at a cost of 50,000 dols. The results of treatment have been encouraging, the last report showing 21 per cent. of apparent cures, besides 32 per cent of cases in which the disease was arrested. A longer stay than three months is necessary, even in the earlier stages. Most of those discharged with the disease arrested have returned to their work, while others have taken up out-of-door work, such as farming.

The Free Hospital for Consumptives occupies a site of fifty-six acres on the lake about one mile from the Cottage Sanatorium; it was opened in 1902 with a capacity for fifty patients. It is under the same management as the Cottage Sanatorium, and was erected by Mr. Gage and the Massey Estate.

There are no places in the immediate vicinity outside of

these sanatoria where persons may find satisfactory accommodation if recommended to seek this climate for the relief of pulmonary disease. There are, however, various small hotels throughout the lakes and a modern well-appointed hotel, the Royal Muskoka, three hours distant by boat from Gravenhurst, where tourists are received during the summer.

The Georgian Bay extends eastward from Lake Huron; the Muskoka Lakes are near its southern end. In the bay are over 30,000 islands which resemble closely the Thousand Islands of the St. Lawrence. The innumerable channels are traversed by steamers which afford a most fascinating trip from Penetang to Parry Sound. Penetang is one hundred miles from Toronto by rail and is a favourite summer resort. The islands are well wooded and afford excellent camp sites. This region is well adapted for sufferers from hay-fever. There are various resorts, such as Honey Harbour, Midland, Rose Point, Moon River, Sans Souci, where summer visitors find satisfactory accommodations at very moderate cost. There is good fishing at nearly all of these points and convenient access to the Magnetawan River, Muskoka Lakes, Lake Rosseau, and Lake Joseph. All these points are easily reached by the Grand Trunk Railway from Toronto.

Toronto (latitude 43°, 40′ north) is on the north shore of Lake Ontario. It is one of the most beautiful cities in Canada, and has a salubrious climate. The drainage is thorough and there is a fine water supply. One of the interesting features of Toronto is the City Dairy, which receives and prepares for distribution by most approved methods, nearly all the milk sold to the inhabitants. The rigid system of inspection and bacteriological examination ensures a satisfactory service.

There is no malaria in Toronto and very little in Ontario. The disease occurs to a slight extent on the northern shores of Lake Erie and in the flat regions near Lake St. Clair. Lakes Ontario, Huron, and Superior are free from it. It has largely disappeared in the Province of Quebec and is unknown in the Lower Provinces and rare in the north-west. The great Lakes are visited in summer to a large extent. The various resorts are too numerous to mention here. The writer prefers Lake Superior to all the others because of its cooler air, its wilder

and more picturesque scenery, its greater opportunities for sport, and because he has had a more intimate personal experience of its many attractions, on both the Canadian and American side, than in case of the other lakes. The elevation of the lake is 606 feet.

On the Canadian side the principal settlement is about Thunder Bay at the head of which Port Arthur and Fort William afford accommodations. These places are now easily reached by steamer or by the Canadian Pacific Railway, and are suitable places in which to prepare for further excursions to attractive camping and fishing grounds. Nepigon River, the outlet of Lake Nepigon, is 64 miles east of Port Arthur, and is famous for its wonderful trout fishing, the finest trout stream in America. The basaltic cliffs of Pie Island, Isle Royale, and Thunder Cape add a grandeur to the region of Thunder Bay, and make a profound impression on the tourist who takes the time to explore, by boat or canoe, the north shore of this superb lake.

To what extent and in what way can this climate be utilised? For what classes of cases is it desirable to recommend this region?

Men, and especially young men, would naturally enjoy it most. There are some localities where women will find suitable accommodations, such as Port Arthur, or Fort William, or Sault Ste. Marie, and if ladies have had previous experience in camps and if a number of them can go together, a camping trip on Thunder Bay or the Nepigon River is within the range of propriety and possibility.

No one who requires any special article of diet, or who is liable to sudden or severe illnesses, should venture far from a base of supplies and the more civilised stations. No one with active pulmonary or cardiac disease should go on camping expeditions in these regions. While the air is exhilarating, there are sometimes violent atmospheric changes and deluges of rain that render camp life not altogether devoid of trials. No one who is unable to tramp over carries for a mile or two, with at least a gun, or who is unable to take a turn at the paddle or an oar, should enter upon such long trips. While a certain amount of physical endurance is necessary it is also of the utmost

importance that whoever is responsible for the safety of the members of the party should have a strong will and good judgment. It is not safe to trust to the advice of Indian guides. These men need a firm control and explicit directions, and will accomplish more and be far more satisfactory when held under strict discipline. But in respect to transportation, especially with reference to bad weather, their cautions should be respected.

Probably the best results of such expeditions are obtained in cases of melancholia and hypochondria. If it is possible to secure the services of a young physician or intelligent medical student of force of character and tact, familiarity with travel and particularly out-of-door life, then much can be done in these cases. The writer has in mind the case of a young lawyer whose despondent condition was the result of a partial sunstroke received in training for a boat-race. Melancholy was so intense as to lead the relatives to fear a termination by suicide. European travel afforded no relief. The plan of sending him to the north-west in charge of a bright medical student was finally successful in restoring him to health.. The exhilarating, cool atmosphere and an entirely new mode of life changed the habits of thought, sharpened the appetite, and brought refreshing sleep.

The season on Lake Superior opens late and it is not desirable to visit the north shore before the first of July. The woods are dense and campers and voyagers are subjected to many annoyances at earlier dates which are somewhat mitigated after the latter part of the month. The greatest obstacle to exploring and fishing trips early in the season is the black fly. This insect is found all through the north woods and is a persistent and thirsty foe to any who intrudes upon his domain. Mosquitoes are also formidable enemies, and throughout Canada, and especially Manitoba and Alberta, will be found most exasperating as soon as one enters the woods and thickets. In August the flies lose much of their vitality and are well warded off by applying to exposed parts of the body various preparations of oil of tar and oil of citronelle, without which it would be folly to undertake any expedition into this wilderness. Mosquitoes retain their pernicious activity all through the season, and netting is required at night and sometimes by day for

protection from these pests. Nowhere in the United States do mosquitoes make such havoc with the human features as in Manitoba, while black flies, if permitted, will draw streams of blood which run down over the face, and by their wounds even close the eyes and render the unfortunate victim unrecognisable. No one who has not experienced their onslaughts can appreciate how much misery these insects cause the unwary, and it is deemed wise to inform those who contemplate these interior trips what they must prepare for and go armed accordingly. With proper precautions all the delightful features of camp life may be enjoyed at the proper time, and if the trip be chosen with intelligence no hardship need be experienced.

MANITOBA.—Winnipeg, 1,424 miles west of Montreal, at an elevation of 700 feet, has a population of 45,000. It is a substantial city, the capital of the province of Manitoba, and the chief post of the Hudson's Bay Company. It is the great trading centre of the plains. Its climate is remarkable for the great annual range of temperature, amounting in 1899 to 135·9° F. The mean temperature is lower than that of any other large city in America—viz., 34·2° F. The lowest sun temperature was—16·5° F., and the lowest recorded in the shade was—46·5° F. The maximum is 90° F. There is no malaria, but in the woods mosquitoes and black flies are formidable pests. The climate is stimulant and is especially dry during the colder six months of the year. There is nothing to peculiarly interest the visitor, and there is no inducement to break the transcontinental journey at this point.

One hundred and thirty-three miles east of Winnipeg is Rat Portage on the Lake of the Woods. The lake is studded with islands and is a favourite resort for sportsmen. The lake is very picturesque, and the town has a population of 5,000.

Throughout Manitoba and from the Red River to the Athabasca, the range of temperature throughout the year is very great. The intense cold of winter is followed by a summer in which the nights are cool but the midday is often quite hot.

"Early in April the alders and willows of the Saskatchewan country are in bloom; the prairie anemone covers the southern exposures to the very verge of the retreating snow. May, there, brings with it more of the true summer heat than in the pro-

vinces of the St. Lawrence; but the evenings are cool, and throughout the periods of greatest heat the night breezes beget a welcome and refreshing change, accompanied with heavy dews. This protects the cereals from the effects of drought even in the driest seasons, and produces a rich growth of prairie grass." The Rev. Prof. Bryce, of Winnipeg College, Manitoba, writes: "The juncture of the seasons is not very noticeable. Spring glides insensibly into summer, summer into fine autumn weather, which, during the equinox, breaks up into a series of heavy gales of wind accompanied by rain and snow. These are followed by that divine aftermath, the Indian summer, which attains its true glory in the north-west. The haziness and dreamy fervour of this mysterious season have often been attributed to the prairie fires, which rage over half a continent in the fall and evoke an enormous amount of heat and smoke."

In Southern Alberta, Chinook winds blow frequently during the autumn, winter, and spring, licking up the snowfall and raising the temperature, so that there is a good deal of warm, bright, spring-like weather in which the ground is bare of snow.

In Saskatchewan and Alberta the winter begins in November and continues until March. Wheat is sown in April and the harvest begins in August. Oats, barley, and rye, and hay are grown successfully everywhere. In the fertile valley north of Edmonton, Alberta, there are large herds of cattle. Immigration follows the railway lines with amazing rapidity. During 1898-1899 and 1900, 17,000 immigrants came into Northern Alberta. From present indications about 10,000 persons will take up residence in this territory during the coming year.

ALBERTA AND BRITISH COLUMBIA.—Calgary, in the province of Alberta, is 840 miles west of Winnipeg, and has an elevation of 3,500 feet; population, 5,000. The climate is dry and bracing. The mean anuual temperature is about 35° F. The mean annual rainfall is 11·5 inches. Tuberculous patients who are fairly robust find at Calgary a cool, stimulating climate suitable for them during the warmer months. There is also a good general hospital.

Banff is on the eastern slope of the Rocky Mountains in the Rocky Mountain Park of Canada. This park embraces over 4,500 square miles and includes the Yoho Park Reserve. The

beautiful Bow Valley, Ghost River, Lake Minnewanna, and scores of mountains ranging from 8,000 to 11,000 feet high, are included in the Reserve. Banff itself has an elevation of 4,500 feet, and the C.P.R. Hotel has a beautiful site at the confluence of the Bow and Spray Rivers. The valley is of rare beauty; the rushing waters and snow-topped mountains are characteristic of the entire region. The hotel is three miles from the station, it is well equipped and is open during the summer months. The air is exhilarating and there are good drives and many interesting excursions can be made.

The locality is said to afford exemption from hay-fever. The hot sulphur springs, varying in temperature from 80 to 121° F. contain calcium and magnesium sulphate. They are on Government property and the water is conducted in pipes to the hotel and to a sanatorium near by. The hotel has a large swimming pool with tub baths, and the water is kept at 98° F. At the Sanatorium there are various hot and steam baths with spout and needle baths; gout, rheumatism, and similar affections have been successfully treated. This institution has facilities for general hospital work, and is under competent direction, but the accommodations are not adequate to what should be expected at so important a resort.

Laggan, thirty-five miles west of Banff, is the station from which side trips are made to Lake Louise, Lake Agnes, the Victoria Glacier, the Valley of the Ten Peaks, and the Paradise Valley. This region abounds in superb scenery, and well repays the visitor who will remain long enough to explore the many wonderful valleys and the mountains, which must be seen to be appreciated. The best time to visit the Rocky Mountains of Canada is after July 1; before that date the weather is liable to be cold and wet and many of the most interesting places in the neighbourhood of Lake Louise, Mirror Lake, and Lake Agnes are not easily reached on account of snow and ice. The accommodations at Laggan and Lake Louise consist of small chalets, and from them Swiss guides may be engaged for the excursions in the vicinity.

Field, fifty miles west of Banff, is a favourite stopping place for tourists, and there is an excellent chalet hotel near the base of Mt. Stephen and facing Mt. Field. The altitude is 4,052 feet,

and there is a magnificent view of the valley. The Takakkaw Falls may be easily reached from Field. They have a sheer drop of 1,200 feet and are among the most remarkable in the world. The Yoho Canyon and Twin Falls may be visited in a day, and also the beautiful Emerald Lake.

Glacier Station, eighty-four miles west of Field, has an altitude of 4,122 feet. The scenery is inspiring and there is much to interest visitors who can climb mountains and explore the glaciers. Swiss guides are stationed here.

Banff, Field, and Glacier are at about the same altitude, and are in practically the same climate. These places have not as yet been described as health resorts, but merely as attractive railroad stations in the mountains. They are suitable in summer for persons who need a stimulating climate at a moderately high elevation. Neurasthenics who can appreciate mountain scenery and can afford the trip will be greatly benefited in the Canadian Rockies. The advantages that these stations possess are that the number of invalids who visit them is small, and the ownership of the hotels or chalets by the Canadian Pacific Railway insures the best of accommodations.

THE ARROW LAKES.– These lakes extend from Arrowhead, twenty-eight miles below Revelstoke, to Robson, a distance of about 125 miles. They are expanses of the Columbia River and have an elevation of 1,390 feet above sea-level. The upper and lower Arrow Lakes are connected by a narrow passage through which the waters pass southward in a strong current. The shores are bold and mountains, many of them snow-capped, rise abruptly from the lake. Many of these peaks are 6,000 to 8,600 feet above sea level. The waters of the lake are too cold for bathing owing to the melting snow, but on the eastern shore of the Upper Arrow Lake there are two hot mineral springs. The Halcyon Springs have a temperature of 126°, are calcic, saline, sulphated, sulphuretted, and are piped 300 yards to the hotel near the lake shore. There are two plunge baths and individual baths, and the water is shipped for use. The springs are reputed to be valuable in the treatment of rheumatism, which is a common complaint among miners who are constantly exposed to wet and cold. Access is by boat ten miles from Arrowhead.

There are also the St. Leon Springs, fourteen miles from Arrowhead. The waters are hot at their source, and piped about a mile to the hotel, which is near the lake side. The waters are heated for use and employed in the treatment of rheumatism.

Both these hotels are open during the entire year, but there is at present no medical attendant nearer than Revelstoke, thirty-eight miles distant. There is a daily boat each way.

The Arrow Lakes are rarely frozen in winter. Navigation is open throughout the year. They are little known by tourists, and only within the last ten years have they been accessible by rail. There is very little evidence of civilisation; mountain goats and bears are occasionally seen. There are grouse, but ducks are scarce. The lakes abound in salmon and lake trout. Brook and rainbow trout are also found.

The lakes are comparatively free from storms, although showers are frequent in summer, and high winds, and are well suited for canoeing, boating, and for small launches and house-boats. These are to be had on Shuswap and Kootenay Lakes.

The Kootenay Lake has an elevation of 1,500 feet, and has the same general features of the Arrow Lakes. It empties near the town of Nelson into the Columbia River. Lake Windermere, Kootenay Lake, is a good location for camps. The geologic formation is of grey and reddish granite with gneisses, mica schists and argillites. There are rich deposits of gold and silver all through this region, especially in the vicinity of Nelson, Slocan Lake, Rossland, and Okanagan Lake.

KAMLOOPS.—This town of about 2,000 inhabitants is in the valley of the Thompson River, 250 miles east of Vancouver. Its altitude is 1,160 feet and the air is dry and invigorating. The annual rainfall is ten inches. It is better situated than any other place in British Columbia for the treatment of pulmonary affections, since it affords proper climatic conditions and, through C.P.R. railway service, proper access and supplies. There is no special provision for the care of tuberculous patients, but it is quite likely that an institution will be established there at no distant day. Kamloops is much drier than towns on the Pacific or stations in the Rocky Mountains, and there is more wind.

The writer desires to call especial attention to this mountain region of British Columbia. He has recently visited it and trusts that the imperfect notes presented herewith will prove an encouragement to others to make further studies in this most interesting region just beyond our northern boundary.

ALTITUDE IN FACT AND FANCY.

BY HENRY SEWALL, PH.D., M.D.
DENVER, COLORADO.

THE field of the medical climatologist, like that of the sanitarian, is one which continually broadens and deepens before the view as the investigator reaches successively higher and higher points of observation. It would seem to be not impertinent, even before such an Association as this, for each contributor now and then to map out his bearings as an aid to future progress.

We must depend upon the meteorologist for *data* concerning the physical factors which determine the differences of climates. We must look to the physiologist for instruction as to the vital reactions of the normal body to varied meteorologic conditions. But it is on the observations of the clinician, which are fortunately unlimited as to number, but devoid, for the most part, of the searching test of experiment, that we must found our conclusions concerning the influence of climate on living man, sick or well.

Thus the clinician is forced to undertake the solution of some of the most complex problems in physiology and pathology, while, at the same time, he is almost completely deprived of the most valuable aid to scientific investigation, that of experimental verification. It is not surprising, therefore, that in the field of medical climatology the worker is particularly liable to be the victim of the errors to which all original investigators are subject, chief among which are, perhaps, first, inexactness of observation; second, the interpretation of facts by fancies which lead to some preconceived hypothesis, or which satisfy some personal desire. The physical *data* of meteorology become thus the ornaments of his generalisations rather than their foundation. Possibly there occurs to each one here present illustrations of such errors of observation or of logic in climatological writings.

A resident of the city of Denver, at an elevation of one mile above sea level, the writer has naturally come to

estimate the biological influence of altitude as a factor in certain medical cases. In the popular mind of dwellers among or near mountains every function of life is modified or determined by the influence of "thin air." Yet when we attempt an analysis of the physiological relations of altitude, we find at once that we are dealing with a combination of different and hardly separable physical factors; for with the low barometric pressure of elevated regions go low humidity, more sunlight, less atmospheric absorption of solar rays and corresponding increase in their kinetic energy, a magnified difference between the temperatures in the sun and shade and of day and night, new conditions for the evaporation of water and for the absorption and radiation of heat, not to speak of the little known relations of the storage and dissipation of electric energy. All these physical factors, and possibly others that we know not of, are changed when we proceed from one telluric level to another, and the physiological effect is the resultant of their combined action. We are interested in these meteorologic phenomena only in so far as they are reflected in the reactions of the living organisms and so give rise to the science of climatology.

How insufficient mere physical *data* are for the deduction of the climatologist has been pointed out by Captain Glassford and others by showing the lack of parallelism between the isotherms of ordinary *instrumental* and *sensible* or *physiological* temperatures.

Owing chiefly to the progressive aridity of the air with the elevation, the dweller in a high altitude may actually experience the same summer temperature as one who lives at sea level much nearer the pole, and the same winter temperature as one closer to the equator; that is, the *sensible* temperature of a locality, or the temperature it would seem to us to have, is measured not so accurately by the dry bulb thermometer as by the wet bulb. In other words, the physiological effect of external heat is a function of at least two physical variables, heat and humidity.

As to the further physiological influence of the modification of glandular and nervous activity resulting from altered surface evaporation, we can now only conjecture. Then again, merely physical or meteorologic *data* involve nothing subjective. The

modification of the psychical state, one of the most certain therapeutic concomitants of climatic change, is a matter that at present escapes all analysis. It may some day be shown that the psychological relations of climate are mathematically determined by the vast number of physiological variables that make up our machine life. How momentous such considerations must be in the treatment of many diseases it is needless to urge. No thorough exposition of the climatology of high altitudes can be expected until the physiological constants of life in such regions have been accurately ascertained. It is worth suggesting that the influence of this Association may properly be used in seeking to direct towards this subject part of the munificent endowments that have recently been made for the prosecution of original research. Only the best trained worker is competent to resolve into their simplest parts the problems that confront us, and there is no physiological problem so simple but requires for its solution the application of the finest technique and severest scientific reasoning. For example, everyone admits the constant apparent increase in the red blood corpuscles attendant upon removal to high altitudes, but this phenomenon attains an entirely different significance from that at first attached to it when it is considered that even a momentary impediment in a blood stream must cause a local congestion and corresponding increase in the number of blood corpuscles at that point. If it but be granted that an effect of high altitudes is to cause either vascular dilatation of the skin or more sluggish venous outflow therefrom, the curious results of the hæmatologist are explained without presuming an inordinate rapidity in cell multiplication. Indeed, it is, perhaps, more logical to suppose that the increase of blood cells in the peripheral circulation argues for a congested skin; and, if such be the fact, it is not a far-fetched presumption that some of the peculiar physiological attributes of high altitudes may be due to such excessive surface distribution of the nutrient fluid of the body. Such ideas are useful and even necessary as working hypotheses, but it is the chief purpose of this paper to insist that they be not used as argument until distinctly supported by experimental evidence.

The distinguished Italian physiologist, Angelo Mosso, made

an exhaustive set of observations upon human respiration, gas exchange and circulation in the Alps at an altitude about corresponding to the top of Pike's Peak. Mosso's conclusions as to the depth of respiratory movement and the volume of gas exchange incident to high altitudes are directly at variance with the conceptions generally held by clinical writers. According to Mosso, moreover, the tension of carbon dioxide in the blood plays a hitherto unsuspected *rôle*, and he holds that abnormal diminution of that tension is the direct cause of so-called "mountain sickness." The careful reader will insist upon confirmation of these observations before accepting them; and it may be suggested that more purely physiological results should be expected from experiments carried on at a lower elevation and through longer periods of time. Nothing is more obvious than the change, temporary, at least, in the activity of the kidneys incident to change in altitude; yet evidence is altogether lacking as to the cause of this variation in secretion. It is important that we know what, if any, is the relation of altitude to the elimination of metabolites, both nitrogenous and non-nitrogenous. Dr. Webb, of Colorado Springs, tells me that, according to his observations, the quantity of urea excreted by a person living in that place is very much less than the normal as estimated at sea level.

No physiological function rightly attracts more attention in its modification by altitude than does the circulation. The familiar attendance of cardiac dyspnœa upon slight exertion in high altitudes at once marks the heart as an organ whose function is directly affected by change in barometric pressure. The purpose of the heart in the body is solely to maintain a certain arterial blood-pressure; as yet we know nothing whatever of the effect of altitude upon this all-important driving force of the blood. Fortunately the heart submits itself with unusual completeness to clinical observation, and it seems to me that in our physical examinations we have culpably neglected estimates of the individuality and work power of the normal heart. At this point I am obliged to enter the dangerous ground of clinical observation unsupported by the prop of experiment. Provided their sources of error are held in view, the conclusions deduced can do no harm but may serve a useful purpose. It has seemed

to me, in brief, that the characteristic effect of high altitude upon the circulation is an overloading, with a tendency to strain, of the right side of the heart. Some evidences for this view have been presented in detail in another communication.

Admitting tentatively the validity of the conclusion, two sequels must be considered; first, there would be entailed a higher venous congestion of organs, with probable modification of metabolism and tendency to the gouty or lithæmic state; second, the heart would either respond to the strain of heightened right-sided intra-cardiac pressure by increased vigour of contraction, leading to physiological hypertrophy and better nutrition throughout the body, or the organ would fail to answer the extra demands upon its powers; it would then dilate to the right, more or less venous stasis would intervene, and the nutrition of the body would proportionately suffer.

It has seemed to me usually possible to determine by physical examination the character of heart that is not likely to bear well the strain of high altitude life. The clinical features which seem to me to indicate lack of reserve power on the part of the structurally normal heart are abnormal increase in the rate of beat with exertion, or on assuming the erect position; the easy production of dyspnœa with exertion; an increase towards the right of the area of cardiac dulness; undue prominence of the jugular veins in the recumbent position of the patient; but more significant than all, as it appears to me, is what may be called a wavering character of the first sound of the heart with a more or less marked reduplication of that sound. Finally may be mentioned that well-established sign of weakness, the shortening of the first sound with a change in its quality which makes it resemble the second sound, accompanied by more or less abbreviation of the lesser pause.

In my experience, persons suffering from pulmonary tuberculosis, however slight the affection, and manifesting these signs of heart weakness, do not usually thrive well at even a moderately high altitude; and I have repeatedly known such patients, while gradually failing, to immediately improve and proceed steadily towards recovery when sent, under proper conditions, to an elevation of less than 2,000 feet above the level of the sea.

The study of cardiac physiology in relation to pulmonary tuberculosis seems to me to be of supreme importance; partly because in this disease there is already thrown upon the right side of the heart a more or less excessive burden due to the restriction of the vascular area of the lungs. It was once my unfortunate experience to see a patient whose right ventricle was just able to send its blood through lungs far advanced in cirrhotic contraction go to ground after the administration of 15 grains of trional given to induce sleep.

The heart is at once the servant and master of every tissue, and the condition and power of that organ are fair indices of the state of the whole body. In the therapeutic relation I would consider the indications of altitude in pulmonary tuberculosis to chiefly depend upon the vitality of the heart. When this organ can adjust itself to the extra demands incident to considerable elevation above sea level, such reaction probably strengthens it throughout and leads to improvement in the nutrition of every tissue.

It has seemed to me that for every case of pulmonary tuberculosis there is an optimum altitude at which the patient has, other things being favourable, the best chance of improvement. This elevation may be any fraction of 10,000 above sea level. It is the altitude at which is secured the most thorough physiological reaction; let it be exceeded ever so little and the patient's vital powers are over-burdened instead of strengthened.

When the physiological relations of climate are better understood, the climatic treatment of *disease* will give way to the climatic treatment of the *patient*, and our advice will be more definitely founded on the effects on individual metabolism of the various meteorologic conditions available to us. No climate is a specific against any disease, but can only aid in its cure by facilitating in one direction or another the sum of the nutritional processes of the body.

Every climate has its typical effects on the living organism, just as every nation has its pictured type; but in judging a definite medical case the physician must use a type only as a point of departure. For example, the characteristic effect on the nervous system of a person recently arrived in Denver

from the East is one of exhilaration; but some complain of depression and that the feet feel as heavy as lead. Some sleep worse, some better than in lower altitudes. One ill-founded fancy regarding the therapeutic relation of high altitudes to pulmonary tuberculosis seems general both among the laity and the medical profession. It is that persons cured of tuberculosis in high altitudes cannot so safely return to lower levels as patients who have recovered health near their homes. It would require a volume of statistics accumulated through years of research to effectually combat this belief. But, in brief, I think I voice the prevailing opinion of those medical practitioners whose experience has included so-called "cures" in high as well as in low altitudes in maintaining that a re-infection or relapse is no more likely to occur in the one than in the other case when the patient has returned to the scene of his former life.

Without dwelling on the difficulties of achieving or estimating a "cure" in tuberculosis, it will be admitted that most of our favourable cases still show physical evidence of the disease, though the activity of the morbid process has been *arrested.* It is a matter of the highest importance to determine *why* it is that, of the arrested cases whose lives have been saved under appropriate climatic conditions, some return with impunity to the scenes of their former activity and take up again their chosen work, while others venturing the same change of base quickly lose ground and fatally relapse.

In conclusion, I venture to invite the attention of practitioners of high altitudes to an inquiry as to the physical signs by which we are accustomed to recognise the existence and extent of pulmonary tuberculosis.

To illustrate, a patient newly arrived in Denver presents a letter from his medical adviser in the East stating that the said patient has but a slight infiltration of the right apex. Careful examination, however, may reveal fine bronchial râles throughout the right lung besides signs of moisture at the top of the left. This experience has occurred so often with me that I have suspected that one of the early incidents of removal to a higher altitude is either the excitement of a bronchial catarrh, as indirectly it may produce a rhinitis, or that the

climatic change has resulted in disclosing an extent of pulmonary involvement not before apparent, or both.

It is easily possible, of course, that the presumed effect of altitude upon the physical signs is imaginary, and only an illustration of the common circumstances that the same physical condition is variously described by different observers.

Obituary.

MR. GEORGE SAMUEL WATSON.

It is with great regret that we record the death, at the age of 59, of Mr. George Samuel Watson, of 3, Mount Ephraim Road, Tunbridge Wells, who was a foundation Fellow of the British Balneological and Climatological Society, and one of its Vice-Presidents.

He was educated at Kensington Grammar School and after beginning his medical studies with Dr. Loadman, of Hammersmith, completed them at St. George's Hospital. Here Mr. Watson gained several prizes, and qualified M.R.C.S. 1865 and L.S.A. 1867. Among the appointments he held were those of Resident Medical Officer to the Marylebone Infirmary, Acting Surgical Registrar to St. George's Hospital, and Surgeon to the Orphans' Home, Tunbridge Wells. In 1867 he went to Tunbridge Wells to join the late Dr. Trustram, whose third daughter he subsequently married. After practising for ten years at Thaxted in Essex, he returned to Tunbridge Wells in 1881, and remained there till his death.

Of late years his health had been anything but satisfactory, and he had been in the habit of spending some of the winter months on the Mediterranean. While at Algiers about two months ago, he was asked to see professionally an English lady suffering from influenza. He caught the disease himself, but recovered. Mr. Watson was returning home, feeling stronger after his stay in the South, but he suddenly succumbed to heart-failure while in the train between Marseilles and Lyons on May 28. He was brought home and buried at Tunbridge Wells on June 3.

On the few occasions when Mr. Watson attended the meetings of the Balneological and Climatological Society in its early days, his professional attainments, sound judgment,

and pleasing courteous manners attracted the attention of many who were not already acquainted with him, and it was thought he would prove a most suitable man for the Presidential Chair. But failing health and the demands of a large practice made it impossible for him to attend the meetings, and precluded the Council from offering him the honour they had intended.

His friends in the Society have at least the satisfaction of knowing that his past connection with the Society will not be forgotten, for the names of his sons, Dr. Charles and Dr. George Watson, both in practice at Tunbridge Wells, remain amongst the roll of Fellows.

Another irreparable loss has been sustained by the recent death of Dr. Ivor Murray, who acted as President during the session 1899-1900. An obituary notice of the deceased gentleman will appear in the next issue of the Journal.

Notes and News.

THE Annual Dinner of the Incorporated Society of Medical Officers of Health was held at the Holborn Restaurant on Friday, Oct. 9, the President, Dr. Joseph Groves, J.P., of Carisbrooke, Isle of Wight, in the Chair. Sir Wm. Church, Bart., President of the Royal College of Physicians, proposed the toast of "The Society."

DR. GROVES is well known as one of the most active and earnest of the Vice-Presidents of our own Society, and his advice and counsel are always helpful.

IN the course of his speech, proposing the health of "The Guests," he referred to the effect which the British Balneological and Climatological Society would produce in the future on the work of Medical Officers of Health resident in the Health Resorts of Great Britain, by stimulating them to secure in their towns the most perfect sanitation possible. He also pointed out that when other problems had been solved, they would perforce gradually direct their attention more and more to the climatic features of the localities in which they resided.

WE can heartily endorse these wise remarks of Dr. Groves and look forward to the day when every medical officer of health resident in a health resort, will be a Fellow of the British Balneological and Climatological Society; for the scientific work of the two societies runs on parallel lines and we believe it will become an anomalous position for a medical officer of health to hold office without showing that his attention and thoughts are directed to the climatic features which influence disease in his locality.

British Balneological & Climatological Society.

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1898 BENNET, Arthur George, M.R.C.S., L.R.C.P., St. Anne's Hill, Cork.
1896 BENNETT, Charles J., M.R.C.S., 10, Hardwicke Street, Buxton.
1900 BENSON, John R., F.R.C.S., L.R.C.P., 1, Oxford Row, Bath.
1902 BENTLIF, Philip Barnett, M.R.C.S., L.S.A., 50, Eagle Terrace, David Place, St. Heliers, Jersey.
1897 BERRY, Frederick Chas., B.A., M.D., B.Ch., Locarno. Burnham, Somerset.
1897 BERRY, John Bourne, M.R.C.S., L.S.A., Wellington House, Wellington Crescent, Ramsgate. C. 1901-
1896 BIDWELL, Leonard, F.R.C.S., 15, Upper Wimpole Street, W.
1897 BIRTWELL, Daniel, L.R.C.S., L.R.C.P., Durban, Natal.
1900 BISSHOPP, Francis R. B., M.D., Belvidere, Tunbridge Wells.
1896 BLACK, J. Gordon, M.D., 7, Cambridge Crescent, Harrogate.
1896 BLAKER, Walter, C.M., M.R.C.S., L.S.A., Royal Societies' Club, 63, St. James's Street, S.W. C. 1897-1900.
1902 BONSALL, George R. E., L.R.C.P., L.R.C.S., Edleston House, Queen's Road, Aberystwith.
1897 BOWES, Chas. Keswick, M.B., M.A., B.Ch., 2, Marina Crescent, Herne Bay.
1896 BOWKER, George, M.B., Denbigh Lodge, Oldfield Park, Bath.
1897 BRAITHWAITE, John, M.D., 42, Spring Gardens, Buxton. C. 1903.
1897 BRANTHWAITE, R. Welsh, M.D., L.R.C.P., The Cedars, Rickmansworth.
1895 BROCKATT, Andrew A., M.D., L.R.C.P., Hazeldean, Malvern. C. 1899-1901.
1896 BRODIE, F. Carden, M.D., B.S., Westmount Broadway, Sandown, I. of Wight.
1900 BROWN, A. Warwick, M.B., C.M., 5, Price's Avenue, Cliftonville, Margate.
1896 BROWN, F. Gordon, M.R.C.S., L.S.A., 17, Finsbury Circus, E.C.
1899 BROWN, J. Murdoch, M.D., F.R.C.P., 9, Walker Street, Edinburgh.
1896 BRUCE, William, M.D., The Castle, Dingwall, Strathpeffer.
1901 BUCKLEY, Charles W., M.D., 14, Hardwick Street, Buxton.
1896 BULLMORE, W. King, M.D., Arwenack, Falmouth. C. 1896-97.
1897 BURNET, Robert W., M.D., F.R.C.P., 36, Grosvenor Street, W.

1898 CAMPBELL, Harry, M.D., M.R.C.P., 23, Wimpole Street, W. T. 1901-
1897 CAMPBELL, Henry Johnston, M.D., M.R.C.P., 36, Manningham Lane, Bradford.
1899 CAMBPELL, J. William, M.D., M.R.C.P., D.P.H., Casa Rossa, Mentone.
1897 CANNEY, H. E. Leigh, M.D., M.R.C.S., F.R.M.S., Assouan, Egypt.
1898 CANTLIE, James, M.A., M.D., F.R.C.S., 46, Devonshire Street, W.
1895 CARDEW, G., M.R.C.S., L.S.A., 5, Fauconberg Villa, Cheltenham. C. 1895-6.
1902 CARPENTER, Geo., M.D., M.R.C.P.Lond., 12, Welbeck Street, W.

1897 CASE, William, M.R.C.S., L.S.A., Denmark House, Caistor-on-Sea.
1898 CATHCART, George C., M.A., M.B., C.M., 35, Harley Street, W.
1895 CHALDECOTT, John Hy., L.R.C.P., 2, Lancaster Road, Hampstead, N.W.
1898 CLARKE, Ernest, M.D., F.R.C.S., 3, Chandos Street, Cavendish Square, W.
1895 CLARKE, J. Michell, M.D., M.A., F.R.C.P., 28, Pembroke Road, Clifton. C. 1895-98.
1896 CLIPPINGDALE, S. D., M.D., F.R.C.S., 36, Holland Park Avenue, W. C. 1903-
1896 CORBETT, Thomas, M.R.C.S., Severn House. Droitwich.
1897 COSENS, C. Hyde, L.R.C.P., M.R.C.S., San Clare, Paignton.
1896 COWAN, Frederick, M.R.C.S., 27, Queen's Square, Bath.
1896 CREIGHTON, Robert H., B.A., M.B., Ballyshannon, Co. Donegal.
1897 CRERAR, Charles, M.B., C.M., Moninmail, Silloth.
1895 CROOK, H. Evelyn, M.D., F.R.C.S., 64, Castletown Road, West Kensington. C. 1895-6, 99-1900.
1899 CROOM, Sir J. Halliday, M.D., F.R.C.P., 25, Charlotte Square, Edinburgh.
1902 CROSS, Geoffrey, L.R.C.P., M.R.C.S., L.S.A., 102, High Street, Ramsgate.
1896 CROSSE, Edward J., M.R.C.S., L.R.C.P., D.P.H., St. Neots.
1896 CROWDY, F. D., M.D., Belvidere House, Torquay.
1897 CRUIKSHANK, Brodie, M.A., M.D., C.M., Nairn.
1896 CUFFE, Edward Meade, M.D., Woodhall Spa.
1895 CUFFE, Robert, M.R.C.S., L.S.A., Woodhall Spa. C. 1895-97, 1901. V.P. 1897-
1896 CUMMING, G. W. Hamilton, M.D., M.R.C.P.Ed., Annandale, Torquay. C. 1900-02. V.P. 1902-
1896 CUTHBERTSON, J. M., F.F.P.S., L.R.C.P., Highfield, Droitwich.

1896 DALY, W. J., M.B., C.M., 14, Cornfield Road, Eastbourne.
1900 DANIEL, G. W. B., M.R.C.S., L.R.C.P., St. Colino Street, Edinburgh.
1898 DANIEL, R. N., M.R.C.S., L.R.C.P., 13, Nevern Square, South Kensington, S.W.
1902 DANIELL, David Hugo, L.R.C.P. and S., 53, Campden Hill Square, W.
1897 DANVERS, Herbert, L.S.A., L.R.C.P., L.R.C.S., 5, Corso Regina Elena, Florence.
1897 DAVIES, J. H., M.D., M.R.C.S., "Tir-Caradoc," Port Talbot.
1896 DAVIES, W. Bowen, L.R.C.P., J.P., Brynarlais, Llandrindod Wells. C. 1897- V.P. 1898-
1900 DAVIS, W. H., M.B., M.R.C.P., 27, Grand Parade, St. Leonards-on-Sea.
1901 DELBRUCK, Raoul E., M.B., M.R.C.S., 13, Buckingham Gate, S.W.
1895 DOCKRELL, Morgan, M.A., M.D., 9, Cavendish Square, London, W. C. 1896. L. 1898- V.P. 1903.
1900 DODD, John, M.D., M.Ch., R.U.I., 14, King Street, Leicester.
1896 DODD, Percy, M.D., 14, Manor Road, Folkestone.

1900 DODD, Walter Harry, L.R.C.P., L.S.A., 5, Stanford Avenue, Brighton.

1896 DODSWORTH, Frederick C., L.R.C.P., M.R.C.S., Arlington Road, Chiswick.

1898 DOWSE, T. Stretch, M.D., F.R.C.P., M.R.C.S., 14, Welbeck Street, London, W.

1899 DRAKE, Thomas George, L.R.C.P., L.R.C.S., Remenham Villa, Datchet.

1899 DUNCAN, Edward H., M.A., M.B., Strathpeffer Spa, N.B.

1900 DUNKLEY, William W., F.R.C.P., La Plaiderie House, Guernsey. C. 1902-03.

1895 EARDLEY-WILMOT, R., M.B., 8, Euston Place, Leamington. C. 1896-99. V.P. 1895-

1896 EAST, Charles H., M.D., B.S., M.R.C.S., St. Clair, Great Malvern,

1901 EDWARDS, Gerald Dundas, M.A., M.R.C.S., Assouan, Egypt.

1897 ELLIOTT, George B., M.D., L.R.C.S.I., Holwell, Brixham.

1896 ELLIS, W. Mc.D., M.D., L.R.C.P., 8, Bladud Buildings, Bath.

1902 ELRINGTON, Nicolas, B.A., L.R.C.P., M.R.C.S., Dalkeith House, Leamington.

1896 EVANS, J. Morgan, L.R.C.S., L.R.C.P., J.P., Melrose, Llandrindod Wells.

1898 EWART, William, M.D., B.A., F.R.C.P., 33, Curzon Street, W. H.V.P.

1900 FAGGE, T. H., M.D., M.R.C.S., L.R.C.P., Monte Carlo, Monaco.

1898 FELKIN, Robert Wm., M.D., L.R.C.P., L.R.C.S., 48, Westbourne Gardens, W.

1896 FERGUSSON, J. Campbell, M.D., The Hydro Establishment, Great Malvern.

1902 FLINT, Thomas Buxton, M.R.C.S., L.R.C.P., 8, Hardwick Street, Buxton.

1900 FORBES, Norman Hay, F.R.C.S., L.R.C.P., M.R.C.S., Drumminor, Tunbridge Wells.

1902 FORSTER, A. G. Foljambe, M.D., C.M., 4, Imperial Square, Cheltenham.

1900 FORSTER, Frederick C., M.R.C.S., L.R.C.P., 1, Park Mansions, North Parade, Lowestoft.

1897 FOSTER, Geo. Michael, M.D., L.R.C.P., M.R.C.S., San Remo.

1900 FOULDS, Francis H., M.R.C.S., L.R.C.P., Droitwich.

1895 FOX, R. Fortescue, M.D., M.R.C.P., F.R.M.S., Strathpeffer Spa. (Winter address: 29, Weymouth Street, W.) C. and V.P. 1895- P. 1898-99.

1900 FRASER, Forbes, F.R.C.S., L.R.C.P., 2, Circus, Bath.

1896 FRASER, John Hosack, M.B., F.R.C.P.Ed., Fernfield, Bridge of Allan, N.B.

1897 FREYER, P. Johnston, M.A., M.D., M.Ch., L.M., 46, Harley Street, London, W.

1900 FROST, Edward, M.B., Chesterfield, Chesterfield Road, Eastbourne.

1899 FURNER, Willoughby, M.D., F.R.C.S., 13, Brunswick Square, Brighton. C. 1900-01.

1896 Gage-Brown, Chas. H., M.D., 85, Cadogan Place, S.W.
1897 Gairdner, Matthew W., M.B., L.R.C.S., L.M., 128, Rione Amadeo, Naples.
1896 Gardner, J. Twiname, M.R.C.S., L.R.C.P., Watersmeet, Ilfracombe.
1900 Gardner, T. Fred., M.D., M.R.C.P., M.R.C.S., The Moyne, Boscombe Spa Road, Bournemouth.
1897 Gardner, Wm. Thomas, M.B., L.R.C.P., M.R.C.S., Fairseat, Poole Road, Bournemouth.
1897 Gibson, Charles, M.D., L.R.C.P., Victoria Avenue, Harrogate.
1898 Gilchrist, Alexander W., M.D., M.R.C.S., L.R.C.P., 39, Boulevard Victor Hugo, Nice.
1899 Goff, Bruce E., M.B., 126, Marine Parade, Brighton.
1896 Gordon, H. Laing, M.D., Via Palestro A, Florence. C. 1897-99.
1901 Gordon, William, M.D., M.R.C.P., 3, Bamfield Crescent, Exeter.
1901 Grant, J. W. Geary, L.R.C.P., M.R.C.S., The Hall, Llanwrtyd Wells.
1898 Gray, Harry, M.B., C.M., Kingsbridge, S. Devon.
1902 Green, George R., L.R.C.P., L.M., M.R.C.S., 7, Park Street, Ripon.
1896 Greenway, Alfred G., M.D., M.Ch., Plas de Winton, Llandrindod Wells.
1896 Gresswell, Albert, M.A., M.D., Louth.
1896 Greves, Hyla, M.D., M.R.C.P., Rodney House, Poole Road, Bournemouth.
1896 Griffin, William Watson, F.R.C.S., 68, Brunswick Place, Brighton.
1902 Griffiths, John, M.R.C.S., L.S.A., Llandrindod Wells.
1896 Groves, Joseph, M.D., F.G.S., J.P., Glenmount, Carisbrook, Isle of Wight. C. 1901. V.P. 1902-
1897 Guillemard, B. J., M.D., C.M., M.R.C.S., Aliwal North, Cape Colony.

1896 Habgood, Henry, M.D., L.R.C.P., Stafford House, Eastbourne. C. 1901-
1897 Hackney, John, M.D., M.R.C.S., The Knoll, Hythe. C., 1898-02.
1895 Haldane, William, M.D., F.R.C.P., Viewforth, Bridge of Allan, N.B. C. 1895-1900. V.P. 1895-
1901 Hall, Octavius, L.R.C.P., L.R.C.S., 7, Clarendon Terrace, Stoke, Devonport.
1897 Hands, Charles H., M.B., M.R.C.S., Glendalough, Totland Bay, Isle of Wight.
1896 Harbord, Augustus, M.R.C.S., L.R.C.P., 36, Bedford Square, W.C.
1902 Harburn, John English, L.R.C.P., L.R.C.S., Crescent View, Buxton.
1896 Hardwick, Arthur, M.D., Prospect House, Newquay, Cornwall.
1896 Harsant, Joseph George, The Hive, Exeter Road, Bournemouth. C. 1897-1900.

1901 HARTLEY, John, M.B., L.R.C.P., Lismore House, Buxton.
1897 HAVELL, C. G., L.R.C.P., M.R.C.S., Felixstowe. C. 1898-01.
1900 HAWTHORN, C. O., M.D., M.R.C.P., 28, Weymouth Street, W.
1901 HAYWARD, John W., M.R.C.S., L.S.A., Whitstable.
1901 HEANEY, Fras. J. S., M.A., M.D., F.R.C.S., 3, Brighton Parade, Blackpool.
1897 HEDLEY, W. S., M.D., 8, Mansfield Street, W.
1900 HEMMING, John J., M.R.C.S., L.S.A., 2, Grosvenor Villas, Eaton Road, Margate.
1896 HERBERT, Alfred C., L.S.A., J.P., Southwold.
1902 HEWLETT, Wm. Hy., M.D., D.P.H., Wivenhoe, Essex.
1900 HILL, G. William, M.D., 26, Weymouth Street, W.
1896 HILLYER, W. H., M.R.C.S., Blythburgh, Polworth Road, Streatham.
1898 HIND, Harry, F.R.C.S., Blytheholme, Victoria Avenue, Harrogate.
1897 HOBHOUSE, Edmund, M.D., M.R.C.P., B.Ch., 36, Brunswick Place, Brighton. C. 1901-2. V.P. 1903.
1896 HOBSON, Lewis John, M.D., B.S., F.R.C.S., 30, Swan Road, Harrogate.
1896 HOLBECHE, Arthur O., M.R.C.S., L.R.C.P., Abbotsfield, Great Malvern. C. 1902-3. V.P. 1903.
1897 HOLLAND, James Frank, M.D.R.U.I., St. Moritz, Engadine.
1902 HOLLIS, Alfred, M.D., Tower House, Freshwater, Isle of Wight.
1896 HOSKER, J., M.R.C.S., Kirkleatham, Boscombe, Bournemouth. C. 1900.
1898 HOUCHIN, E. King, L.R.C.P., L.M., L.R.C.S., Ravensworth, Cranbrook Road, Ilford, Essex.
1897 HUNTINGTON, William, M.R.C.S., L.R.C.P., 43, South Street, St. Andrews, N.B.
1896 HUSKIE, David, M.A., M.B., C.M., Moffat.
1898 HUTCHINSON, Roger J., M.R.C.S., L.R.C.P., Lowside, Haslemere.

1895 INGLIS, Arthur Stephen, M.D., 5, Pevensey Road, St. Leonards-on-Sea. C. 1899-1901.
1895 INGLIS, John, M.A., M.D., 18, Cornwallis Gardens, Hastings. C. 1896-99. V.P. 1895-
1897 IREDALE, J., L.R.C.P., L.R.C.S., Mablethorpe, Lincolnshire.

1899 JAMES, Alexander, M.D., F.R.C.P., 10, Melville Crescent, Edinburgh.
1896 JOHNSTON, George F., M.D., M.R.C.P., 3, Montague Place, Montague Square, W.
1895 JOHNSTON, Thomas, M.D., M.R.C.P., Annandale, Ilkley. C. 1896-97.
1897 JOHNSTON, Wm. A., L.R.C.P.I., L.R.C.S.I., 51, Branstone Road, Burton-on-Trent.
1895 JONES, H. Shirley, M.R.C.S., L.S.A., Ravenstone, St. Andrew's Road, Droitwich. C. 1895-98. Sec. 1898-
1897 JONES, M. Handfield, M.D., 35, Cavendish Square, W.

1897 JONES, William Black, M.D., B.S., D.P.H., Llangammarch Wells, Breconshire. C. 1898-
1900 JOSEPH, A. Hill, M.D., Glanmot, Cantelupe Road, Bexhill-on-Sea.

1896 KEETLEY, C. R. B., F.R.C.S., 56, Grosvenor Street, W. T. 1896-99. V.P. 1899-
1896 KERR, J. G. Douglas, M.B., C.M., J.P., 6, Royal Circus, Bath. C. 1896- V.P. 1898-1900. P. 1901-2.
1896 KING, Preston, M.D., 27, Gay Street, Bath. C. 1903.
1895 KINGSBURY, George C., M.A., M.D., 3, Brighton Parade, Blackpool. C. 1895-98-
1898 KINGSCOTE, Ernest, M.B., C.M., 31, Lower Seymour Street, W.
1898 KNOTT, William, L.R.C.S., L.R.C.P., 15, Great Castle Street, W.
1902 KNOWLING, Ernest Mansfield, M.B., B.A., M.R.C.S., North Bay View, Tenby.
1898 KNUTHSEN, L. F. M., M.B., C.M., Grove House, Woodlane, Falmouth.
1897 KROHN, Ronald E. S., M.D., M.R.C.S., Funchal, Madeira.

1899 LARKING, Arthur E., M.D., M.R.C.S., D.P.H., 1, London Street, Folkestone.
1898 LAWRIE, Macpherson T., M.D., "Greenhill," Weymouth.
1896 LEE, Robert, M.D., F.R.C.P., 39, Gunterstone Road, West Kensingson, W.
1899 LEIGH, John Dickinson, M.B., F.R.C.S., 7, Avenue Road, Scarborough. C. 1901-2.
1898 LEON, George A., M.A., M.D., D.P.H., Hillsdon, Sidmouth, C. 1899-1902. V.P. 1901-
1902 LEON, John Temple, M.D., B.Sc., D.P.H., Elmwood, Grove Road, Southsea.
1897 LETTERS, Patrick, M.D., D.S.M., D.P.H., Valentia Island, Co. Kerry, Ireland. C. 1898-1900.
1902 LEWIS, Ernest E., M.D., M.R.C.S., L.R.C.P., 30, Weymouth Street.
1895 LEWIS, Percy George, M.D., M.R.C.S., 22, Manor Road, Folkestone. C. 1902-
1901 LITTLE, James, M.D., F.R.C.P., 14, Stephen's Green, Dublin. C. 1902- V.P. 1901.
1897 LIVESEY, Edgar William, L.S.A., Alderney, Channel Islands.
1900 LLOYD, Hugh James, L.R.C.P., L.S.A., Tyncoed, Barmouth.
1900 LORIMER, George, M.A., M.D., 9, Terrace Road, Buxton.
1896 LOVE, William, L.R.C.S.I., L.M., Manor House, Hoddesdon.
1896 LOWE, George May, M.D., F.R.C.P., Castle Hill House, Lincoln.
1896 LOWE, T. Pagan, M.R.C.S., 16, Circus, Bath.
1900 LOWTHER, Richard, M.D., M.R.C.S., Fernleigh, Grange-over-Sands.
1898 LUFF, Arthur P., M.D., F.R.C.P., M.R.C.S., 9, Queen Anne Street, W. T. 1899-1901. C. and V.P. 1901-02.
1897 LYDDON, Richard, M.R.C.S., L.S.A., Cavendish House, Victoria Parade, Deal.

1899 LYON, Thomas Glover, M.A., M.D., M.R.C.P., 1, Victoria Square, S.W.
1896 LYS, Henry Grabham, M.D., Southbrook, Poole Road, Bournemouth.

1901 MACDOUGALL, John A., M.D., 3, Rue Herman, Cannes.
1900 MACFIE, Ronald Campbell, M.A., M.B., C.M., Southview, Llandrindod.
1897 MACINDOE, Alexander, M.D., D.P.H., Old Hayes, Sidmouth.
1897 MACKENZIE, A. L., M.R.C.S.I., 6, Brock Street, Bath.
1896 MACKENZIE, Thomas, M.A., M.D., Sidney Mount, Douglas, Isle of Man. C. 1899-1901.
1895 MACQUEEN, Thomas, M.B., C.M., 10, Bolton Road, Eastbourne. C. 1895-1901.
1900 MAHOMED, A. G. S., M.R.C.S., L.S.A., Astolat, Bournemouth. C. 1902-
1899 MARSHALL, Augustine, M.D., L.R.C.P., 145, London Road, Lowestoft.
1896 MARSHALL, J. N., M.D., C.M., 7, Battery Place, Rothesay.
1895 MARTIN, Edward F., M.D., 7, Royal Terrace, Weston-super-Mare.
1897 MAY, William Page, M.D., B.Sc., M.R.C.P., Helouan, Cairo (November to April); 9, Manchester Square (May to October).
1897 MCAULAY, Matthew, M.D., M.Ch., 31, Market Street, Hoylake.
1899 MCCALMAN, Dove, M.D., Oban, N.B.
1897 MCCANN, Frederick J., M.D., M.R.C.P., 5, Curzon Street, Mayfair, W.
1895 MCCLURE, Henry, M.D., M.Ch., 36, Weymouth Street, W. C. 1895-01. V.P. 1899- C. 1903.
1895 MCFARLANE, Alexander R., M.R.C.S., L.R.C.P., 27, Milner Street, Chelsea, S.W.
1897 MCLAREN, Hugh, M.B., Ch., The Elms, Callender, N.B.
1896 MERRALL, H., M.B., Ch., Glen Eldon Road, St. Annes-on-Sea.
1896 MERRICK, Horace T., M.B., Swiss Cottage, Surbiton.
1897 MERRICK, Robert W., M.D., 3, Palmerston Road, Dublin.
1897 MILNER, Vincent, M.B., C.M., Oak Lodge, Parkstone, Dorset.
1897 MINTER, L. John, M.D., M.R.C.S., L.R.C.P., Clovelly House, Brunswick Road, Hove, Sussex. C. 1902-
1901 MITCHELL, R. Pryce, M.D., M.R.C.S., Villa Henri, Monte Carlo.
1896 MOLLOY, Leonard, M.A., M.D., 3, Brighton Parade, Blackpool. C. 1903.
1896 MORGAN, William P., B.A., M.B., Hurdes House, Seaford. C. 1902-
1898 MORISON, Alexander, M.D., F.R.C.P., 14, Upper Berkeley Street, W.
1896 MOUILLOT, F. A., M.D., B.A., B.Ch., Eton House, Harrogate. C. 1902-
1896 MOXON, A. H., M.R.C.S., 44, King Street, Great Yarmouth. C. 1896-97.

1895 MOXON, William, M.D., M.R.C.S., L.R.C.P., West View, Matlock Bridge, C. 1895-1900. V.P. 1900-2.
1899 MUIRHEAD, Claude, M.D., F.R.C.P., 30, Charlotte Square, Edinburgh.
1897 MUNRO, Seymour H., M.D., L.R.C.S., Nantwich.
1902 MURRAY, Gawler, L.R.C.S., L.R.C.P., 38, Gladstone Street, Scarborough.
1901 MURDOCH, Andrew, M.B., C.M., 24, Albert Road, Bexhill-on-Sea.
1897 MUSGRAVE, C. B. Thomas, M.D., M.R.C.S., L.R.C.P., 2, Shrublands, Cromer. C. 1899-01.
1896 MUSPRATT, Chas. D., M.D., B.S., F.R.C.S., Tantallon, Madeira Road, Bournemouth.
1895 MYRTLE, Andrew S., M.D., J.P., F.R.S.Ed., Harrogate. C. 1895-99. V.P. 1895-96- P. 1897.

1899 NAYLOR, Rupert George, L.R.C.P., L.R.C.S., Smythesdale, near Ballarat, Victoria, Australia.
1902 NEWELL, Percy, L.R.C.P., L.R.C.S., Sillwood Place, Crowborough.
1896 NEWINGTON, H. Hayes, M.R.C.P., M.R.C.S., The Gables, Ticehurst.
1901 NICHOLLS, John Michael, L.R.C.P., M.R.C.S., Penwyn, St. Ives, Cornwall.
1902 NIGHTINGALE, Percy Athelstan, M.D.Ed., 56, Ludgate Hill, E.C.
1900 NOBLE, Stanley, M.D., M.R.C.S., L.R.C.P., 1, Montpelier Terrace, Brighton.
1898 NOURSE, Stuart, C.M., M.R.C.S., L.R.C.P., Hurst Villa, Jackson Road, Clacton-on-Sea.

1902 ODDIN-TAYLOR, Gordon E., M.R.C.S., L.R.C.P., 44-46, L. Market Street, Pietermaritzburg, S. Africa.
1897 ODELL, William, F.R.C.S., Ferndale, Torquay.
1896 OLIVER, George, M.D., F.R.C.P., M.R.C.S., Harrogate (June-Oct.); Riversleigh, Farnham, Surrey (Nov.-May). C. 1897-1901. V.P. 1897-
1895 ORWIN, Arthur W., M.D., 15, Weymouth Street, W. C. 1895-99. V.P. 1899-
1902 OWEN, John Morgan, L.R.C.P., M.R.C.S., Fishguard, R.S.O., S. Wales.
1897 OZANNE, Frederick N., L.R.C.P., M.R.C.S., Sheep House, Harrogate.

1896 PARDINGTON, Geo. Lucas, M.D., L.R.C.P., M.R.C.S., 47, Mount Pleasant Road, Tunbridge Wells.
1900 PARKER, Robert D., M.A., M.D., Caledon, Cape Town, S. Africa.
1896 PARSLOE, Henry, M.R.C.S., L.R.C.P., 5, Buckland Terrace, Plymouth.
1895 PEARSE, William H., M.D., M.R.C.P., 1, Alfred Place, Plymouth. C. 1895-96.
1901 PECHELL, Major A. A., M.B., C.M., Culverton House, Alton, Hants.

1900 PINKERTON, Charles, M.D., 6, Queen's Road, Southport.
1900 PLANT, James Robert, L.R.C.P., M.R.C.S., 8, Boon Place, Plymouth.
1895 POLLARD, Reginald, M.B., M.R.C.S., 8, Higher Terrace, Torquay. C. 1895-1900.
1900 POPE, F. M., B.A., M.B., M.R.C.P., 4, Prebend Street, Leicester.
1896 POPE, H. Campbell, M.D., 280, Goldhawk Road, Shepherd's Bush, W.
1899 POPE, Percy, M.D., L.R.C.P., M.R.C.S., 74, Mortimer Street, W.
1902 POWELL, O. E., M.D., Fontenelle, Jersey.
1896 POWELL, Sir Richard D., Bart., M.D., F.R.C.P., 62, Wimpole Street, W. H.V.P.
1896 PRINCE, J. Perrot, M.D., M.R.C.S., Durban, Natal. C. 1897-1900.
1897 PRITCHARD, Owen, M.D., M.R.C.S., 41, Gloucester Square, Hyde Park, W.
1898 PRUEN, Septimus T., M.D., M.R.C.S., Sherborne Lodge, Cheltenham. C. 1899-

1897 RANKING, John E., M.A., M.D., F.R.C.P., 18, Mount Ephraim Road, Tunbridge Wells. C. 1899- V.P. 1901-
1895 RAWLINSON, Fredk. J., F.R.C.S., Stuart House, Bognor.
1902 REID, Douglas A., M.D., M.R.C.S., L.S.A., 12, The Norton, Tenby. C. 1903.
1900 RENDALL, Stanley M., M.D., M.R.C.S., Les Palmerios, Mentone (winter); Hotel Thermal, Aix-les-Bains (summer).
1896 ROBERTS, Francis, L.R.C.P., M.R.C.S., Church Road, Forest Hill, S.E.
1897 ROBERTS, Frederick T., M.D., F.R.C.P., 102, Harley Street, W.
1896 RODEN, Percy A., M.B., Frear Street, Droitwich.
1901 ROSSITER, George F., M.B., M.R.C.S., Cairo Lodge, Weston-super-Mare.
1901 ROUSE, Rolla, M.D., Winter Palace, Monte Carlo.
1902 ROWNTREE, George A., M.D., M.Ch., Luxor, Egypt.
1899 RUSSELL, George, M.B., C.M., J.P., Claremont House, Oudtshoorn, S. Africa.
1899 RUSSELL, William, M.D., F.R.C.P., 3, Walker Street, Edinburgh.

1901 SANDERS, Gordon, M.D., C.M., Villa Nina, Cannes.
1897 SANDWITH, Fleming Mant, M.D., M.R.C.P., Cairo, Egypt.
1896 SANSOM, Arthur E., M.D., F.R.C.P., 84, Harley Street, W.
1899 SCLANDERS, Alexander, M.D., 2, Academy Street, Nairn.
1896 SCOTT, John Walter, L.R.C.P., L.M., M.R.C.S., Highfield, 126, Tulse Hill, S.W.
1899 SCOTT, Thomas B., M.R.C.P. and S., Aldington, Poole Road, Bournemouth.
1901 SELKIRK, John, M.A., M.B., C.M., Boston Spa, Yorkshire.
1896 SHARPE, William Cecil, M.D., C.M., Smedley's Hydropathic Establishment, Matlock.
1896 SHAW-MACKENZIE, J. A., M.D., 31, Grosvenor Street, W.
1902 SIKES, Arthur Walker, M.D., M.R.C.P., F.R.C.S., 40, Argyll Road, Kensington.

1901 SIM, Roderick, M.R.C.S., L.R.C.P., Villa Ciro, Monte Carlo.
1900 SIMPSON, W. J. Ritchie, M.D., 14, Gloucester Place, W.
1896 SIMPSON, W. S., M.R.C.S., M.R.C.P., Heslington House, Worthing.
1896 SMITH, Francis W., M.D., Assynt, Harrogate.
1902 SMYTH, Wm. Johnson, M.D.Ed., The Hydro, Bournemouth.
1896 SNAPE, Ernest, M.D., 41, Welbeck Street, W.
1895 SNOW, William V., M.D., F.R.C.P., 2, Richmond Gardens, Bournemouth. C. and V.P. 1895- P. 1897-98.
1896 SOLLY, Ernest, M.B., L.R.C.P., Strathlea, Coldbath Road, Harrogate. C. 1896- V.P. 1901-
1896 SPICER, Scanes, M.D., 28, Welbeck Street, W.
1897 SPILSBURY, Francis J., L.R.C.P., L.R.C.S., Hogsthorpe, Lincolnshire.
1896 STARTIN, James, M.R.C.S., 15, Harley Street, W.
1898 STEPHENSON, Sydney, M.D., M.R.C.P., F.R.C.S., 33, Welbeck Street, W.
1895 STIELL, Gavin, M.B., 54, Elms Road, Clapham Common, S.W.
1898 STIVENS, B. H. Lyne, M.D., M.R.C.S., 107, Park Street, W.
1896 STOCKER, W. W., M.R.C.S., L.R.C.P., 253, High Road, Willesden Green, W.
1896 STREET, Alfred F., M.A., M.D., D.P.H., Burghfield, St. Mildred's Road, Westgate-on-Sea. C. 1897- V.P. 1901- P. 1903.
1897 SUMPTER, W. J. Ernley, L.R.C.P., Sheringham.
1895 SUNDERLAND, Septimus, M.D., M.R.C.P., 11, Cavendish Place, Cavendish Square, W. Sec. 1895-
1897 SWINHOE, George Rodway, M.R.C.S., L.R.C.P., New Swindon, Wilts.
1902 SWORDER, Ernest G., M.B., L.R.C.P., West Terrace, Folkestone.
1900 SYMES, Ernest, M.R.C.S., L.R.C.P., Craigmore, West Street, Scarborough. C. 1903.
1902 SYMES-THOMPSON, Henry E. M.A., M.R.C.S., L.R.C.P., 33 Cavendish Square, W.
1902 SYMONS, H. B. Trehane, L.S.A., L.R.C.P., 263, Riv. di Chiara, Naples.
1900 SYMONS, William Henry, M.D., D.P.H., Guildhall, Bath.

1897 TAYLOR, James A., M.B., C.M., Dunkeld, N.B.
1897 TELLET, Frederick S., L.R.C.P.I., Auburn House, Ramsey, I. of Man.
1895 THOM, Alexander, M.A., M.D., Viewfield, Crieff. C. 1895-99-
1897 THOMAS, Abraham, M.B., M.R.C.S., L.R.C.P., 22, North Parade, Aberystwith. C. 1897-
1895 THOMAS, Arthur W., M.D., "Carmelita," Crabton Close Road, Boscombe, Bournemouth.
1896 THOMPSON, E. Symes, M.D., F.R.C.P., 33, Cavendish Square, W. H.V.P. P. 1902-03. C. 1903.
1896 THOMPSON, G. H., L.R.C.P., M.R.C.S., 1, High Street, Buxton. C. 1900-2. V.P. 1903-
1901 THOMSON, Herbert C., M.D., F.R.C.P., 34, Queen Anne St., W.

1896 THOMSON, Robert, M.D., Ivydene, Sweyn Road, Cliftonville, Margate. C. 1900-01.
1897 THOMSON, St. Clair, M.D., F.R.C.S., 28, Queen Anne Street, W. C. 1901-02.
1898 THORNE, W. Bezly, M.D., 53, Upper Brook Street, W.
1898 THORNE-THORNE, Leslie, M.D., B.S., 45, Inverness Terrace, W.
1896 THURSFIELD, Thos. William, M.D., F.R.C.P., J.P., Selwood, Beauchamp Square, Leamington. C. 1896-98. V.P. 1896-
1895 TOLLER, C. W. E., M.D., Castle House, Ilfracombe. C. 1895-1902.
1897 TOWNSEND, R. H., M.B., B.A., M.R.C.S., Queenstown, Ireland. C. 1897-8.
1897 TUBBY, A. H., M.S., F.R.C.S., 25, Weymouth Street, W.
1897 TURNER, William, M.A., M.D., Gibraltar.
1896 TYSON, W. J., M.D., M.R.C.S., 14, Langhorne Gardens, Folkestone. C. 1896-1900. V.P. 1899-

1896 UNDERHILL, T. H., M.B., C.M., 54, Dulwich Road, Herne Hill, S.E.

1902 VISE, Christopher, M.D., M.R.C.S., 39, Mount Pleasant Road, Tunbridge Wells.

1898 WADDELL, Arthur R., M.D., C.M., Potters Bar, Middlesex. C. 1901-03.
1896 WADE, Charles H., M.A., L.R.C.P., 19, Royal Terrace, Southend-on-Sea.
1896 WAINWRIGHT, Lennox, M.D., L.R.C.P., 113, Sandgate Road, Folkestone.
1898 WALKER, A. W. H., M.D., L.R.C.P., Argylle House, Harrogate.
1897 WALKER, Henry Roe, M.R.C.S., L.R.C.P., 8, Harley Street, W.
1896 WALSH, Leslie, M.R.C.S., L.R.C.P., 21, Gay Street, Bath.
1897 WALTERS, F. Rufenacht, M.D., M.R.C.P., F.R.C.S., Crooksbury Sanatorium, Farnham, Surrey.
1896 WARD-HUMPHREYS, G. H., M.R.C.S., L.R.C.P., 26, Charles Street, St. James's, S.W. C. 1896-
1897 WARNOCK, Hugh T. A., L.R.C.P., F.R.C.S.I., Donegal.
1902 WATSON, Bertram, M.D., M.R.C.S., Mont Laurel, Walker Road, Harrogate.
1899 WATSON, Charles Robert, M.D., L.R.C.P., 5, Mount Ephraim Road, Tunbridge Wells. C. 1901-
1899 WATSON, D. Chalmers, M.B., M.R.C.P., 22, Coates Crescent, Edinburgh.
1900 WATSON, G. T., M.A., M.B., F.R.C.S., 47, Mount Ephraim Road, Tunbridge Wells.
1900 WATSON, Wm. Crawford, M.D., Beech Villa, Ripon Road, Harrogate.
1902 WEATHERLEY, Lionel Alex., M.D., C.M., M.R.C.S., Bailbrook House, Bath.
1897 WEBER, Frederick Parkes, M.A., M.D., F.R.C.P., 19, Harley Street, W. C. 1901.

1899 WEIR, Archibald M., L.R.C.P. and S., St. Giles, Malvern Link.
1899 *WELLESLEY-GARRETT, A. S. C. 1902.
1899 WHITBY, Charles, M.D., Oldfield Park, Bath. C. 1900-
1897 WHITE, Charles P., M.A., M.B., M.R.C.S., 22, Cadogan Gardens, S.W.
1896 WHITE, Edward Alexander, M.A., M.D., 5, Upper Marine Terrace, Margate. C. 1896-98.
1900 WIGMORE, J., M.D., R.U.I., 26, Green Park, Bath.
1899 WILKINSON, John, M.D., M.Ch., D.P.H., Woodville, Droitwich.
1896 WILKINSON, Percy J., F.R.C.S.Ed., 10, Hillside Mansions, Highgate, N.
1897 WILLIAMS, Charles R., M.B., C.M., Ivanhoe Terrace, Ashby-de-la-Zouch.
1901 WILLIAMS, Chisholm, F.R.C.S., 20, Bedford Square, W.C.
1898 WILLIAMS, Cyril J., L.R.C.P., L.R.C.S., Brook Side, Woodhall Spa. C. 1900-01.
1897 WILLIAMS, John Robert, M.B., Bryn Hyfryd, Penmaenmawr.
1896 WILLIAMS, Leonard, M.D., M.R.C.P., 8, York Street, Portman Square, W. C. 1898-1901. V.P. 1901-
1896 WILLIAMS, Neville, M.A., M.D., Sydenham House, Harrogate.
1897 WILLIAMS, Owen, L.R.C.P., L.R.C.S., Bronheulog, Burry Port, Wales.
1899 WILLS, Joseph P. B., M.D., M.R.C.S., Bexhill-on-Sea. C. 1903-
1897 WISE, A. T. Tucker, Montreux.
1896 WOHLMANN, A., M.D., Rotorua, New Zealand.
1896 WOODS, J. F., M.D., 29, Queen Anne Street, W.
1896 WYER, Otho, M.D., M.R.C.S., Epperston House, The Avenue Road, Leamington.

1895 YOUNGER, Edward George, M.D., M.R.C.P., 19, Mecklenburgh Square, London, W.C.
1899 *YOUNG, Major L. Tarleton, M.D., Indian Medical Service.

NAMES OF TOWNS WHERE FELLOWS RESIDE.

The names of those Fellows marked with an asterisk (*) have not communicated their address.

ENGLAND.

ALTON.—Pechell, Major A. A.

ASHBY-DE-LA-ZOUCH. — Williams, Chas. R.

BATH.
Bannatyne, Gilbert A.
Bayliss, R. A.
Begg, Chas.
Benson, John R.
Bowker, George.
Cowan, Frederick.
Ellis, W. McD.
Fraser, Forbes.
Kerr, J. G. Douglas.
King, Preston.
Lowe, T. Pagan.
Mackenzie, Alex. L.
Symons, W. H.
Walsh, Leslie H.
Weatherley, L. A.
Whitby, Chas.
Wigmore, J.

BEXHILL-ON-SEA.
Joseph, A. H.
Murdoch, Andrew.
Wills, Joseph P. B.

BLACKPOOL.
Heaney, F. J. S.
Kingsbury, Geo. C.
Molloy, Leonard.

BOGNOR.—Rawlinson, Frederick J.

BOSCOMBE.
Thomas, A. W.
Hosker, J.

BOSTON SPA.—Selkirk, John.

BOURNEMOUTH.
Gardner, T. Fred.

BOURNEMOUTH.—*cont.*
Gardner, Wm. Thomas.
Greves, E. Hyla.
Harsant, Joseph George.
Lys, Henry Grabham.
Mahomed, A. G. S.
Muspratt, Chas. Drummond.
Scott, Thos. B.
Smyth, W. J.
Snow, William V.

BRADFORD. — Campbell, Henry Johnstone.

BRIGHTON.
Dodd, Walter H.
Furner, Willoughby.
Goff, Bruce E.
Griffin, Wm. Watson.
Hobhouse, Edmund.
Minter, Leonard J.
Noble, Stanley.

BRIXHAM.—Elliott, George B.

BURNHAM. — Berry, Frederick Charles.

BURTON-ON-TRENT. — Johnston, W. A.

BUXTON.
Armstrong, Wm.
Bennett, Chas. J.
Braithwaite, John.
Buckley, Chas. W.
Flint, T. B.
Harburn, J. E.
Hartley, John.
Lorimer, George.
Thompson, G. H.

CAMBRIDGE. — Allbutt, Professor Clifford (Hon.).

CAISTOR-ON-SEA.—Case, William.

CHELTENHAM.
Cardew, G. A.
Forster, A. G. F.
Lawrence, H. Cripps.
Pruen, Septimus Tristram.

CLACTON-ON-SEA.—Nourse, C. M. Stuart.

CLIFTON.—Clarke, J. Michell.

CROMER.—Musgrave, C. B. Thos.

CROWBOROUGH.
Newell, P.

DATCHET.—Drake, Thos. G.

DEAL.—Lyddon, Richard.

DEVONPORT.—Hall, O.

DROITWICH.
Corbett, Thomas.
Cuthbertson, J. M.
Foulds, Francis Henry.
Jones, H. Shirley.
Roden, Percy A.
Wilkinson, John.

EASTBOURNE.
Barnes, Robert.
Daly, W. J.
Frost, E.
Habgood, Henry.
Macqueen, Thomas.

EXETER.—Gordon, Wm.

FALMOUTH.
Bullmore, W. King.
Kneethsen, L. F. M.
*Young, Major L. Tarleton.

FARNHAM.
Oliver, George (Nov.-May).
Walters, F. Rufenacht.

FELIXSTOWE.—Havell, C. G.

FINCHLEY.—Bangay, Richard.

FOLKESTONE.
Barrett, W. P.
Dodd, Percy.
Larking, Arthur E.
Lewis, Percy George.
Sworder, E. G.

FOLKESTONE.—*cont.*
Tyson, W. J.
Wainwright, Lennox.

GRANGE-OVER-SANDS.—Lowther, R.

GREAT YARMOUTH.—Moxon, A. H.

HARROGATE.
Bain, William.
Black, J. Gordon.
Gibson, Charles.
Hind, Harry.
Hobson, Lewis John.
Mouillot, F. A.
Myrtle, Andrew S.
Oliver, George (June-Oct.).
Ozanne, Frederick N.
Smith, Francis W.
Solly, Ernest.
Walker, A. W. Hinsley.
Watson, B.
Watson, W. M. Crawford.
Williams, Neville.

HASLEMERE.—Hutchinson, Roger Jackson.

HASTINGS.—Inglis, John.

HERNE BAY.—Bowes, Charles Keswick.

HODDESDON.—Love, William.

HOGSTHORPE.—Spilsbury, Francis James.

HOYLAKE.—McAulay, Matthew.

HYTHE (Kent).—Hackney, John.

ILFORD.—Houchin, E. K.

ILFRACOMBE.
Gardner, J. Twiname.
Toller, C. W. E.

ILKLEY.
Bampton, A. H.
Bates, W. R.
Johnstone, Thomas.

KINGSBRIDGE (S. Devon).
Grey, Harry.

LEAMINGTON.
Atkinson, Miles H. C.
Eardley-Wilmot, R.

Elrington, N.
Thursfield, Thos. W.
Wellesley-Garrett, A. S.
Wyer, Otho.

LEICESTER.
Dodd, John.
Pope, F. M.

LINCOLN.—Lowe, Geo. May.

LIVERPOOL. — Bickersteth, Edward Robert (Hon.).

LONDON.
Abraham, Phineas S.
Achard, Alexander (Marylebone, W.).
Allen, W. Hamilton (Stanmore).
Baynes, Donald.
Bidwell, Leonard.
Blaker, Walter C.
Brown, F. Gordon.
Bruce, J. Mitchell (Hon.).
Burnet, Robert William.
Campbell, Harry.
Cantlie, James.
Carpenter, Geo.
Cathcart, George C.
Chaldecott, John Henry (Hampstead, N.W.).
Clarke, Ernest.
Clippingdale, S. D. (Kensington).
Crook, H. Evelyn (Kensington).
Daniel, D. H.
Daniel, R. N. (S. Kensington).
Delbruck, R. E.
Dockrell, Morgan.
Dodsworth, Frederick C. (Chiswick).
Dowse, Thos. Stretch.
Ewart, William.
Fayrer, Sir Joseph, Bart. (Hon.).
Felkin, Robert William.
Foster, Sir Walter (Hon.).
Fox, R. Fortescue (Winter).
Freyer, P. Johnston.
Gage-Brown, Charles Herbert (Belgravia, S.W.).
Garrod, Sir Alfred (Hon.).
Harbord, Augustus (Bloomsbury, W.C.).
Hawthorne, C. O.
Hedley, W. S.

LONDON.—*cont.*
Hill, G. W.
Hillyer, William H. (Streatham, S.W.).
Johnston, George F.
Jones, Montagu Handfield.
Keetley, C. R. B.
Kingscote, Ernest.
Knott, William (Oxford Circus, W.).
Lee, Robert (West Kensington).
Lewis, E. E.
Luff, Arthur Pearson.
Lyon, T. Glover (Victoria, S.W.).
McFarlane, Alexander R. (Chelsea, S.W.).
McCann, Frederick John.
McClure, Henry.
May, W. Page (May to Oct.).
Morison, Alexander.
Nightingale, P. A.
Orwin, Arthur W.
Poore, Vivian (Hon.).
Pope, H. Campbell (Shepherd's Bush, W.).
Pope, Percy.
Powell, Sir Richard Douglas, Bart. (Hon.).
Pritchard, Owen.
Roberts, Francis H. (Forest Hill, S.E.).
Roberts, Frederick T.
Sansom, Arthur.
Scott, John Walter (Tulse Hill, S.W.).
Shaw-Mackenzie, J. A.
Sieveking, Sir Edward H. (Hon.)
Simpson, W. J. Ritchie.
Snape, Ernest.
Spicer, Scanes.
Startin, James.
Stephenson, Sydney.
Stiell, Gavin (Clapham Common, S.W.).
Stivens, B. H. Lyne.
Stocker, W. Woodley (Willesden Green, N.W.).
Sunderland, Septimus.
Symes-Thompson, H. E.

LONDON—*cont.*
Thompson, E. Symes.
Thomson, H. Campbell.
Thomson, St. Clair.
Thorne-Thorne, Leslie.
Thorne, W. Bezly.
Tubby, A. H.
Underhill, T. H. (Herne Hill, S.E.)
Walker, H. Roe.
Ward-Humphreys, G. H.
Weber, Fred Parkes.
Weber, Sir Hermann (Hon.).
White, Charles Percival.
Wilkinson, P. J.
Williams, Charles Theodore (Hon.).
Williams, Chisholm.
Williams, Leonard.
Woods, J. F.
Yeo, I. Burney (Hon.).
Younger, Edward George (Bloomsbury, W.C.).

LOUTH.—Gresswell, Albert.

LOWESTOFT.
Forster, F. C.
Marshall, Augustine.

MABLETHORPE.—Iredale, J.

MALVERN.
Brockatt, Andrew A.
East, Charles Henry.
Fergusson, J. Campbell.
Holbeche, Arthur Oliver.

MALVERN LINK.—Weir, Archibald Munday.

MANCHESTER.—Roberts, D. Lloyd (Hon.).

MARGATE.
Brown, A. Warwick.
Hemming, J. J.
Thomson, Robert.
White, Edward Alexander.

MATLOCK.
Moxon, William.
Sharpe, William Cecil.

NANTWICH.—Munro, Seymour.

NEWQUAY.—Hardwick, Arthur.

PAIGNTON.—Cosens, C. Hyde.

PARKSTONE.—Milner, Vincent.

PLYMOUTH.
Parsloe, Henry.
Pearse, William H.
Plant, James Robert.

POTTERS BAR.
Waddell, Arthur R.

RAMSGATE.
Berry, John Bourne.
Cross, G.

RICKMANSWORTH. — Branthwaite, R. Welsh.

RIPON.—Green, G. R.

SCARBOROUGH.
Leigh, John Dickinson.
Murray, G.
Symes, Ernest.

SEAFORD. — Morgan, William Pringle.

SHERINGHAM.—Sumpter, W. J. Ernley.

SIDMOUTH.
Leon, George A.
Mackindoe, Alexander.

SILLOTH.—Crerar, Charles.

SOUTHEND-ON-SEA.—Wade, C. H.

SOUTHPORT.—Pinkerton, Chas.

SOUTHSEA.—Leon, J. T.

SOUTHWOLD. — Herbert, Alf. Corbyn.

ST. ANNE'S-ON-SEA.—Merrall, H.

ST. IVES.—Nicholls, J. Michael.

ST. LEONARDS-ON-SEA.
Bagshawe, Frederic.
Batterham, John W.
Davis, W. H.
Inglis, Arthur Stephen.

ST. NEOTS.—Crosse, Edward J.

SURBITON (Surrey).
Merrick, Horace T.

SWINDON.—Swinhoe, George Rodway.

TICEHURST.—Newington, H. Hayes.

TORQUAY.
Crowdy, F. D.
Cumming, G. W. Hamilton.
Odell, William.
Pollard, Reginald.

TUNBRIDGE WELLS.
Bisshopp, F. R. B.
Forbes, Norman H.
Pardington, Geo. Lucas.
Ranking, John E.
Vize, C.
Watson, Chas. Robert.
Watson, Geo. T.

WESTGATE-ON-SEA.—Street, Alfred F.

WESTON-SUPER-MARE.
Aubrey, A. Reuben.
Martin, Ed. Fuller.
Rossiter, George F.

WEYMOUTH.—Lawrie, Macpherson J.

WHITSTABLE.
Hayward, John W.

WIVENHOE.—Hewlett, W. H.

WOODHALL SPA.
Cuffe, Edward Meade.
Cuffe, Robert.
Williams, Cyril John.

WORTHING.—Simpson, W. S.

ISLE OF MAN.

DOUGLAS.—Mackenzie, Thomas.

RAMSEY.—Tellett, Frederick.

ISLE OF WIGHT.

CARISBROOKE.—Groves, Joseph.

FRESHWATER.—Hollis, A.

SANDOWN.—Brodie, F. Carden

TOTLAND BAY.—Hands, Chas. H.

WALES.

ABERYSTWITH.
Bousall, G. R. E.
Thomas, Abraham.

BARMOUTH.—Lloyd, Hugh J.

BURRY PORT.—Williams, Owen.

FISHGUARD.—Owen, J. M.

LLANDRINDOD WELLS.
Davies, W. Bowen.
Evans, John Morgan.
Greenway, Alfred G.
Griffiths, J.
Macfie, Ronald Campbell.

LLANGAMMARCH WELLS.
Jones, Wm. Black.

LLANWRTYD WELLS.
Grant, J. W. G.

PENMAENMAWR.—Williams, John Robert.

PORT TALBOT.—Davies, J. H.

TENBY.
Knowling, E. M.
Reid, D.

SCOTLAND.

BRIDGE OF ALLAN.
Fraser, John Hosack.
Haldane, William.

CALLANDER.—McLaren, Hugh

CRIEFF.—Thom, Alexander.

DUNKELD.—Taylor, James A.

EDINBURGH.
Affleck, Jas. O.
Brown, J. Murdoch.
Croom, Sir J. Halliday.
Daniel, G. W. B.
James, Alex.
Muirhead, Claude.
Russell, Wm.
Watson, D. Chalmers.

GLASGOW.—Alexander, John.

MOFFAT.—Huskie, David.

Nairn.
Cruikshank, Brodie.
Sclanders, Alex.

Oban.—McCalmen, Dove.

Pitlochry.—Beatty, S.

Rothesay.—Marshall, J. N.

Strathpeffer.
Bruce, William.
Duncan, E. H.
Fox, R. Fortescue (in Summer).

St. Andrews.—Huntington, Wm.

IRELAND.

Belfast.—Byers, Prof. John W. (Hon.).

Ballyshannon.—Creighton, Robt. H.

Cork.—Bennett, Arthur Geo.

Donegal.—Warnock, Hugh Thos.

Dublin.
Banks, Sir John (Hon.).
Little, James.
Merrick, Robert Warren.

Queenstown.—Townsend, R. H.

Valencia Island.—Letters, Patrick.

CHANNEL ISLANDS.

Alderney.—Livesay, Edgar Wm.

Guernsey.
Dunkley, Wm. Wilberforce.

Jersey.
Bentlif, P. B.
Powell, O. E.

FELLOWS RESIDING ABROAD.

Aiken (S. Carolina).—McGahan, Chas. F. (Corr.).

Aix-les-Bains.
Blanc, Leon (Hon.).
Forestier, Henri (Corr.).
Rendall, Stanley Morton (in Summer).

Assouan (Egypt).
Canney, E. H. Leigh.
Edwards, Gerald Dundas.

Baden-Baden (Germany).
Gilbert, W. H. (Corr.).

Bex-les-Bains (Switzerland).
La Harpe, Eugene de (Corr.) (Summer).

Cairo (Egypt). — Sandwith, Fleming Mant.

Caledon (S. Africa).—Parker, R. D.

Cannes.
Macdougall, J. Aymers.
Sanders, Gordon.

Cape Colony.—Guillemard, B. J.

Durban (Natal).
Birtwell, Daniel.
Prince, J. Perrott.

Florence.
Danvers, Herbert.
Gordon, H. Laing.

Gibraltar.—Turner, William.

Helouan (Egypt).—May, Wm. Page (November to April).

Lausanne.—La Harpe, Eugene de (in Winter) (Corr.).

Luxor (Egypt).—Rountree, Geo. Atkins.

Madeira. — Krohn, Ronald Edward Stewart.

Mentone.
Campbell, J. William.
Rendall, Stanley Morton (in Winter).

MONTE CARLO.
Barnard, John Henry.
Fagge, T. H.
Mitchell, R. Pryce.
Rouse, Rolla.
Sim, Roderick.

MONTREUX (Switzerland).—Wise, Alfred Thos. Tucker.

NAPLES (Italy).
Gairdner, Matthew Wm.
Symons, H. B. T.

NEUENAHR (Germany).—Grübe, Karl (Corr.).

NICE (France).
Amy, George.
Gilchrist, Alexander Wm.

OUDTSHOORN (South Africa).
Russell, George.

PHILADELPHIA. — Hinsdale, Guy (Corr.).

PIETERMARITZBURG.—Oddin-Taylor, G. E.

PYRMONT (Germany). — Marcus, Sigismund (in Summer) (Corr.)

ROTORUA (New Zealand).
Wohlmann, A.

SAN REMO (Italy).
Foster, Geo. Michael.
Marcus, Sigismund (in Winter). (Corr.)

ST. MORITZ (Switzerland).
Holland, James Frank.

VICTORIA (Australia). — Naylor, Rupert Geo.

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